Engin.
YEAR OF SERVICE TO THE METAL WORKING INDUSTRY
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THE IRON AGE

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STEEL

TAILORED TO FIT YOUR NEEDS

Island Display

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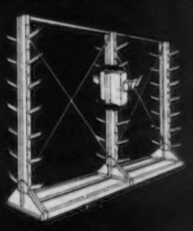
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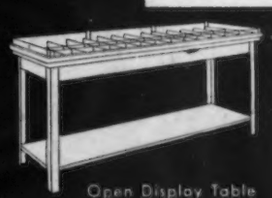
Open Display Table

A Specially Designed Berloy Air-Conditioning Cabinet

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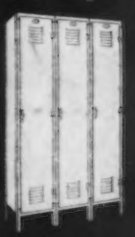
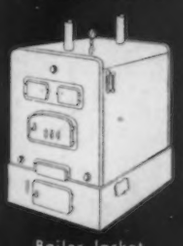
THE BERGER MANUFACTURING CO., CANTON, OHIO
Division of REPUBLIC STEEL CORPORATION

Counter Height File


Single Tier Locker

Wardrobe Cabinet


Boiler Jacket

Shelving

YOU OWE IT TO YOUR STOCKHOLDERS TO USE toncan iron

Money spent for repairs to plants must come out of profits. Continual repairs are a steady drain on the funds that should go to stockholders. That's why all repairs involving the use of sheet metal should be studied, so that the loss caused by rusting may be kept to a minimum. That's why Toncan Iron should be viewed in the light of its ultimate cost—not merely the material first cost.

Toncan Iron is the most economical ferrous metal for industrial uses—ducts—roofing and siding on buildings—gutters and downspouts—wherever rust or corrosion cause rapid failure of metals only slightly lower in cost. It is a true alloy of refined iron, copper and molybdenum. It resists rust better than any metal in its price class, and is surpassed only by the stainless steels. It is ductile and easy to work. It lasts years longer, and consequently costs less—allows more for profits.

Many uses for Toncan Iron are suggested in "The Path to Permanence." A copy will be sent on request.

More than a ton of Toncan Iron was used for the gutters and downspouts of the Van Camp Oil Products Co. plant, Louisville, Ky.

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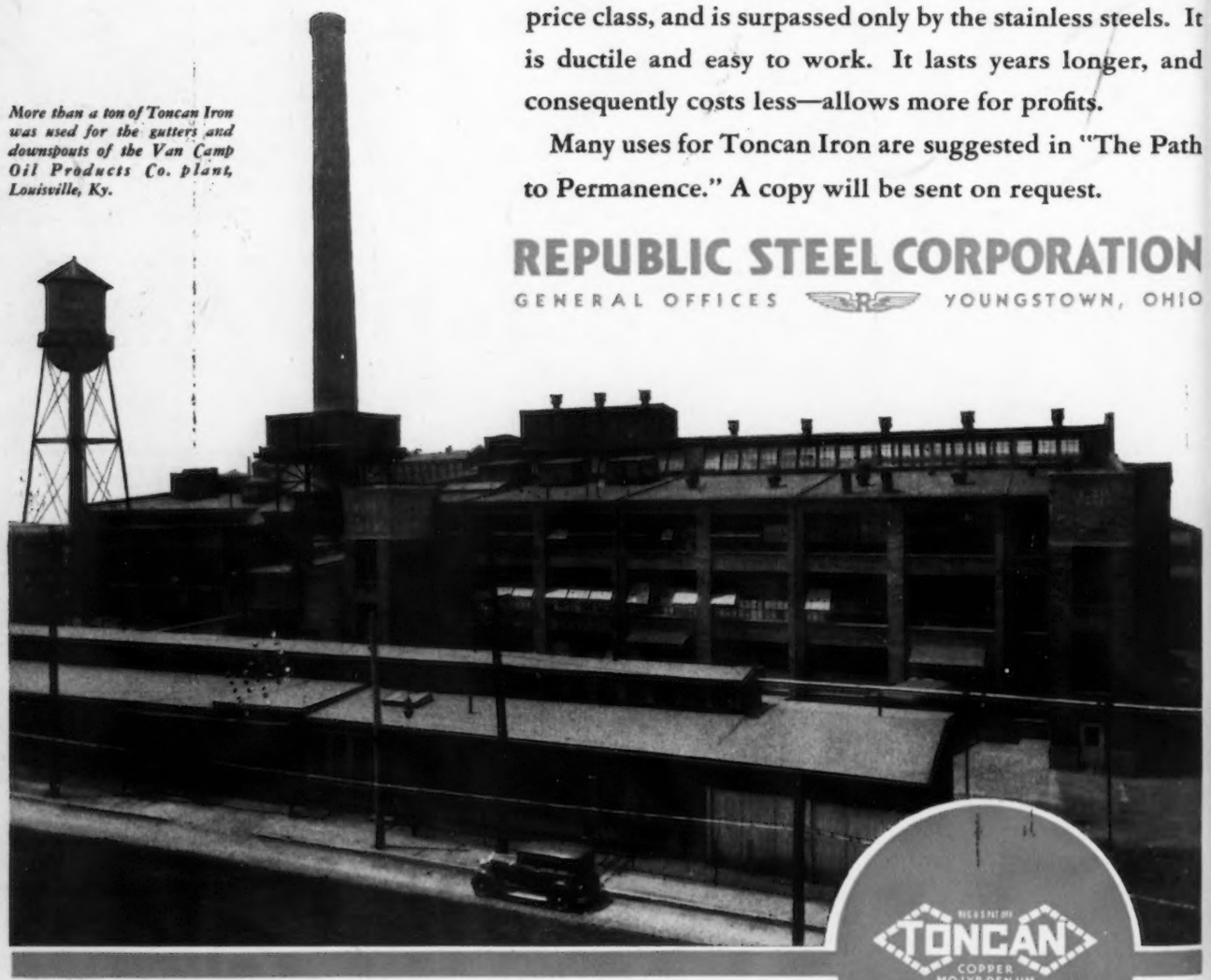
GENERAL OFFICES YOUNGSTOWN, OHIO



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THE IRON AGE, published every Thursday by the *IRON AGE PUBLISHING CO.* Publication Office: N. W. Cor. Chestnut & 56th Sts., Philadelphia, Pa. Executive Offices: 239 W. 39th St., New York, N. Y., U. S. A. Entered as second class matter at the Post Office at Philadelphia under Act of March 3, 1879. $6.00 a year in U. S., Canada $8.50, Foreign $12.00. Vol. 134, No. 14.

THE IRON AGE — October 4, 1934

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NRA U.S. CODE GRAPHIC ARTS INDUSTRY 1934 Registration No. A-3-31-01590

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THE IRON AGE PUBLISHING COMPANY

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PUBLICATION OFFICE: N. W. Corner Chestnut and 56th Sts., Philadelphia, Pa.

EXECUTIVE OFFICES: 239 West 39th St., New York, N. Y., U. S. A.

Member, Audit Bureau of Circulations
Member, Associated Business Papers

Published every Thursday. Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50, including duty; Foreign $12.00 a year. Single Copy 25 Cents

Cable Address, "Ironage, N. Y."

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OCTOBER 4, 1934

ESTABLISHED 1855

Vol. 134, No. 14

Fed Up—

NO people, no matter how buoyant and energetic, can continue to stand up under unrelieved tension. Reaction must come and, in the case of this country, has come. The feverish activity that has accompanied the creation of the New Deal has been wearing. The failure of planned economy to work out according to plan has been disappointing. Emotionally, America wants and needs a rest.

And yet the popular mood is still relatively free from partisan bias. By no means everything that has been done in the name of the New Deal is charged to the debit side of the ledger. The initial monetary moves of the present Administration are generally credited with halting the cumulative deflationary forces which had prostrated the banks, stalled industry and plunged the country into the depths of despair. Subsequent action in this sphere, although at times disturbing to confidence, has failed to warrant the fears of alarmists. And even today, the monetary policy, or lack of policy, at Washington is probably not so unorthodox as critics represent it to be. Final stabilization of the dollar is out of the question so long as the course of the British pound and other unanchored foreign currencies remains uncertain.

While it would be futile to deny that there are justifiable fears regarding our monetary program, especially in relation to the eventual possibility of swollen debts driving us into currency inflation, most of the present dissatisfaction with the New Deal is due to the unhappy results of Governmental efforts in the field of economic control of industry and agriculture. Agricultural control failed to take the elements into account. Industrial control failed to take human nature into account.

The theoretical concept of adequate prices as a necessary foundation for adequate wages led to a maze of administrative complexities, encouraged waves of speculative buying, and unleashed bitter industrial strife. Governmental sponsorship of collective bargaining, instead of making for industrial peace, set in motion a nation-wide campaign for unionization. To gain their ends, the national unions have resorted to virtually all known forms of persuasion and intimidation. Like Chinese bandits, their flying squadrons have swooped down on objective after objective, leaving property damage and broken heads in their wake. While terrorism of this type has accomplished its purpose of closing plants and keeping frightened men away from their jobs, it has been abhorrent to all who cherish civic peace and order.

Law-abiding citizens are getting impatient with private warfare that prevents industry from functioning normally and robs willing employees of the right to work. They are beginning to doubt the efficacy of the countless intricate bureaucratic controls in which business has become enmeshed. They are commencing to question the wisdom of classroom theorists in attempting to uproot long-established customs and practices and implant Utopian schemes. They have grown tired of experimentation that stifles confidence and inhibits enterprise. They are weary alike of high-flown exhortation and intemperate business baiting. They are fed up.

G. L. LACHER,

Managing Editor, The Iron Age.

Special Handling of Precision Tools

By C. A. ZIEBARTH
Secretary and General Superintendent,
Bell & Howell Co., Chicago

SPECIAL methods of checking, listing and caring for tools and gages become imperative when accuracy of finished products makes necessary the manufacture and marking of tools for specific jobs. For example, a hole may be marked 0.1255 in., 0.0003 in. ream. For an operation of this kind it is out of the question to use a standard commercial reamer. An oversized tool must be stoned to exact requirements and then that tool must be kept, until worn out, for that one operation.

The Bell & Howell Co., Chicago, works entirely within the precision field. A plus or a minus tolerance of 0.0003 in. is common practice in the manufacture of motion picture equipment, which must not only operate to the satisfaction of the buyers of a single unit but parts must be interchangeable for quick and accurate replacement at servicing stations, some of which are half way around the globe from the manufacturing plant.

Degree of accuracy demanded throws all tools into two general classifications; namely, general purpose tools, and special precision tools. The former can be handled as customary in many shops, but precision tools, always kept for specific jobs, require a special method to avoid confusion, delays in production, error, and to maintain accuracy. This may be emphasized by pointing out that from commercial reamers measuring 0.125, 0.126 and 0.127 in. there are made and stocked 18 reamers ranging in size from 0.123 to 0.127 in.

Now then as to the method of handling these special tools. In the first place design of each complete piece of motion picture apparatus is

STANDARD PROCESS RECORD

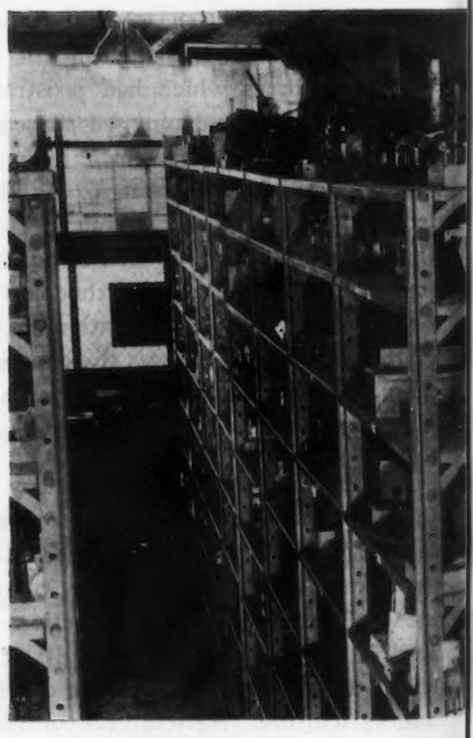
NAME Gate Arm — DESIGN No. 71 — PART No. 4402

ORDER OF OPER.	KIND OF OPERATION	TO DEPT. NO.	SERIAL NUMBER OF TOOLS	INSTRUCTIONS (This space for full instructions, including description and use of tools, jigs, fixtures and machines used for same)	DATE
1.	Bench			Inspect castings	
2.	Bench			Snag. NOTE! do not touch three bearing points on bottom	
3.	Bench			Rub three bottom feet enough so at least 1/2" the spots are	
				surfaced use flat piece of fine emery cloth to remove high	
				spots. Finish on plate	
4.	Bench			Inspect for oper. 2 & 3	
5.	Drill		4682	Ream 1/8" holes, c'bore to depth	
6.	Mill		X2-N3-6-7 4683	Mill .060 dim. on rib	
7.	Mill		X3-4 4683	Mill film clearance	
8.	S.Mill		4861	Mill reel clearance	
9.	Polish			Scratch brush sharp corners on reel clearance	
10.	Bench		4683 N5-6-7 4682-1774	Inspect for oper. #6 - 6 - 7 - 8 - 9	
11.	Finish		4145	Enamel, protect 1/8" holes	
12.	Mill		N2-3 4690 P1	Mill end stop surface to gauge	
13.	Mill		4690 P1 N4	Mill large surface to gauge end cut	
14.	Mill		4685	Mill notches and ends of wings	
15.	Mill		4684	Mill .0035 dim. on wings	
16.	Mill		4686	Mill slot (.1167" dim.)	
17.	Bench		4145 N2-3 4685 N2-3 4684 N-2-3	Inspect for oper. #11 - 12 - 13 - 14 - 15 - 16	
18.	Bench		4748	Punch .033 slot	
19.	Drill		4789	Drill, c'bore & tap 2 - 56 hole	
20.	Bench			Inspect for oper. #18 & 19	

G. O. NO. 2514

G. O. NO. 2514

All tools and gages for a specific machine operation are given a serial number in the tool planning department. These numbers, as well as design, part and operation numbers, are specified on this standard process record.

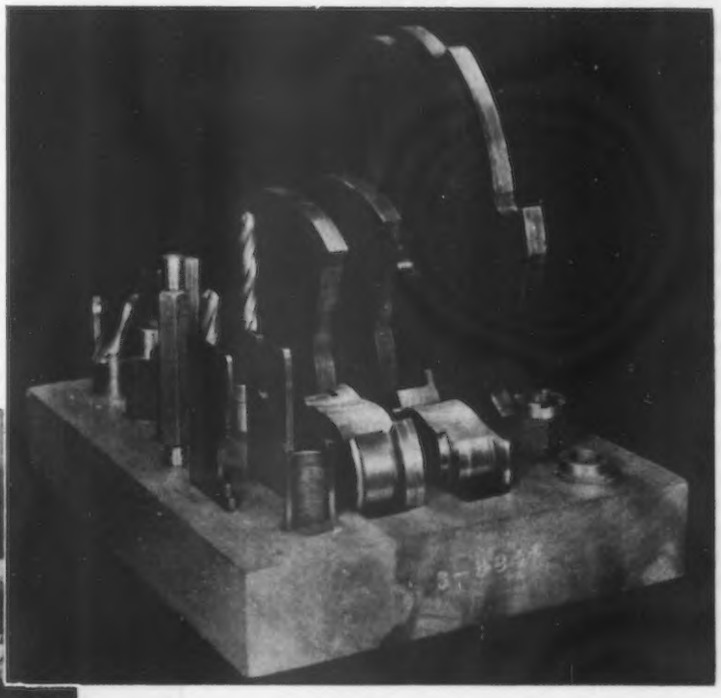


Avoids Production Difficulties

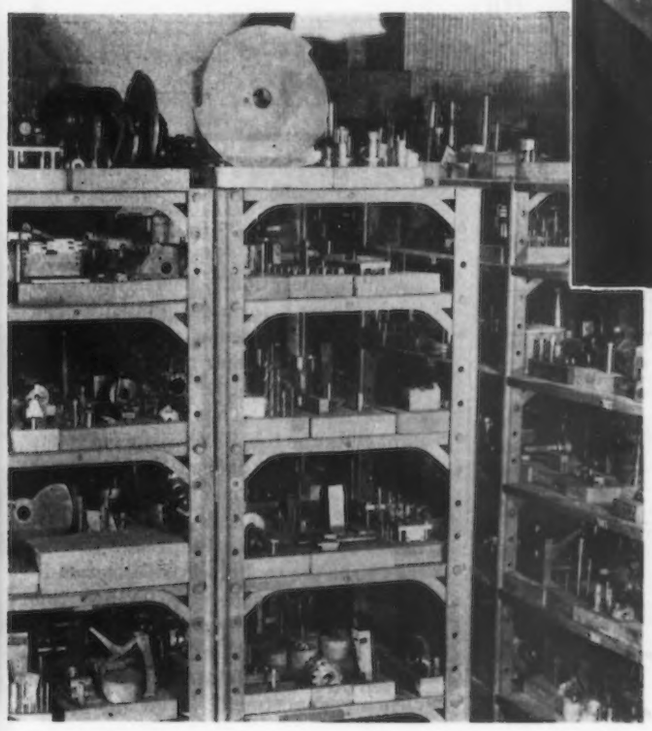
IN the manufacture of motion picture equipment a plus or a minus tolerance of 0.0003 in. is common. In the Bell & Howell plant a large number of precision tools and gages are always kept for specific jobs, and to avoid confusion and production delays and to assure maintaining of the close limits demanded a special method of handling such tools has been devised, as outlined here by Mr. Ziebarth.

given a design number and each part that goes into that apparatus is given a part number. In the tool planning department the sequence of operations is determined and the number and kinds of gages are specified. The operations are serially numbered and all tools and gages necessary for a machine operation are given a number which is designated as a tool serial number. This number refers to the group of tools and gages that are necessary for a given operation. Thus further to identify the tools under each serial number certain suffixes are added. All gages are marked with an "N." All cutting tools that wear in use are marked with an "X" and fixtures are marked "F." If there are more than one of any of the above they are given a serial number to follow the N, X or F. However, for a given set of tools and gages used on a specific job the numerals are never repeated although the letter suffix is not the same. For example, under tool serial number 4682 there could not be F1, X1, and N1. These would be numbered serially, as, F1, X2 and N3. An old number once discarded is never used again; thus if the X2 tool is changed the new tool would be marked X4, the 3 already being attached to the N.

There is also the problem of keeping tools and gages together. It has been solved by the use of wooden blocks that measure about 6 in. x 8 in. x 2 in. Each block is recessed to hold the tools and gages for a specific job, and these tools and the block move together from the tool crib to the production department and back to the tool crib.



ABOVE
Wooden blocks with the serial number stamped on the front hold all the tools and gages for a given operation.



AT LEFT
Section of tool crib showing tool blocks in storage and ready for use. This crib is adjacent to both production and parts clearing departments.

In order to follow through the markings let us assume that we have a motion picture machine designated as design 71 and that one of its parts is designated as part number 4402. The necessary tools and gages for operation No. 5, which is to drill and ream, have been given serial No. 4682. The necessary equipment consists of a reaming fixture F1, two special reamers X2 and X3; a standard com-

DES. | PART | M. O. NO.

ROUTING ORDER

—YELLOW—DEPT. CONTROL
—BLUE—TRAVELER
—PINK—TOOL CLERK

DESCRIPTION OF WORK						NO. BOXES
RAW MATERIAL						LOT NO. INST. NO.
TIME RECORD	ELAPSED TIME	NO. PCS. FINISHED	EMP. NO.	PRICE	PER	DATE ROUTED
						DATE RECEIVED
				REMARKS		SCHEDULED TO START / /
						SCHEDULED TO FINISH / /
				TOOL SERIAL NO.		TIME ALLOWED
						MACH.
						LABOR
			SIGNED	APPROVED		SET-UP
DEPT. & CHECK NO.	OPER. NO.	STA.	M. O. NO.	PART NO.	SEQ.	NO. PCS

Parts and tools are routed by the clearing department clerk. One copy of this form goes to the tool crib attendant who places the block on a truck with the parts to be forwarded to the production department. ▲▲▲

mercial reamer which carries only a general stock number; and five depth and plug gages—numbers N7, N8, N9, N10 and N11. A straight-edge is numbered N12. All of these fit in recesses in a wooden block which has the serial number stamped on it.

Each tool or gage that is fitted in this block has stamped on it the serial number in addition to the number, as F1, X2 or N7, etc., that designates the particular tool. If it is necessary to make more than one set of complete tools under a specific serial number then letters are added to the main serial number. For example, if three sets are made then their serial numbers would be 4682A, 4682B and 4682C and all tools in each of these three blocks would carry the extra marking A, B or C as the case might be so that gage 4682A-N7 will not be placed in the wooden block marked 4682B and therefore supplant the correct gage 4682B-N7. This method is necessary in order to catch errors and locate the exact tool at fault when several sets of like tools are in use. Small special tools that wear fast and are used often are made up and stocked under maximum and minimum requirements and drawn out as needed and put into the tool block.

Clearing Department Routes Parts And Orders Tool Blocks

The central tool crib, fitted with steel shelving, is located close to the production department and adjacent to the parts clearing department through which all parts in process must pass as they go from one operation to another. This clearing department is in charge of a clerk whose duty it is to route parts and see to it that each lot of parts has with it the right block of tools for the next operation. An order from the production contract department having been received in the clearing department the clerk there issues a routing order on the first operation. This is made in triplicate on a form designated as No. 176, two copies going to the production department and one copy to the tool crib. This order shows the tool serial number. The tool crib attendant puts the tool block with the parts and the truck is moved to the proper production department for the operations. If materials go direct from raw material stores to the production department the tool block is delivered direct from the tool crib. When this operation has been completed the tool block complete with all its tools, is put on the truck and sent back to the clearing department. The tool is re-

TOOL STORAGE RECORD

Serial No. 4682

DESCRIPTION OF TOOL	Tool Letter & No.	Tools in Block	No. Pieces	Section	Shelf	Bin	USED ON Design	USED ON Part—S. A.
Reaming Plate	F1	13	1		644			4402
Reamer (.1908)	X2							
" (.1978)	X3							
.1254 - .0002 reamer	Stock #831							
Depth gauge (.706)	N7							
Plug " (.1255)	N8							
" " (.189)	N9							
" " (.197)	N10							
Depth " (.657)	N11							
Straight edge	N12							

OVER

▲▲▲ The tool storage record lists all tools bearing a given serial number. Quantity of tools on block and shelf location are specified, as shown.

DESCRIPTION					S—				
No. of Pgs.			No. Pgs. in Block		No. of Blocks			Shelf Location	
Date Out	To Dept.	Date In	Per Change Order No.	Remarks & O.K.	Date Out	To Dept.	Date In	Per Change Order No.	Remarks & O.K.

This new form, 4 x 6 in., provides a permanent record of the use and condition of all tools, furnishing pertinent data for future use. ▲▲▲

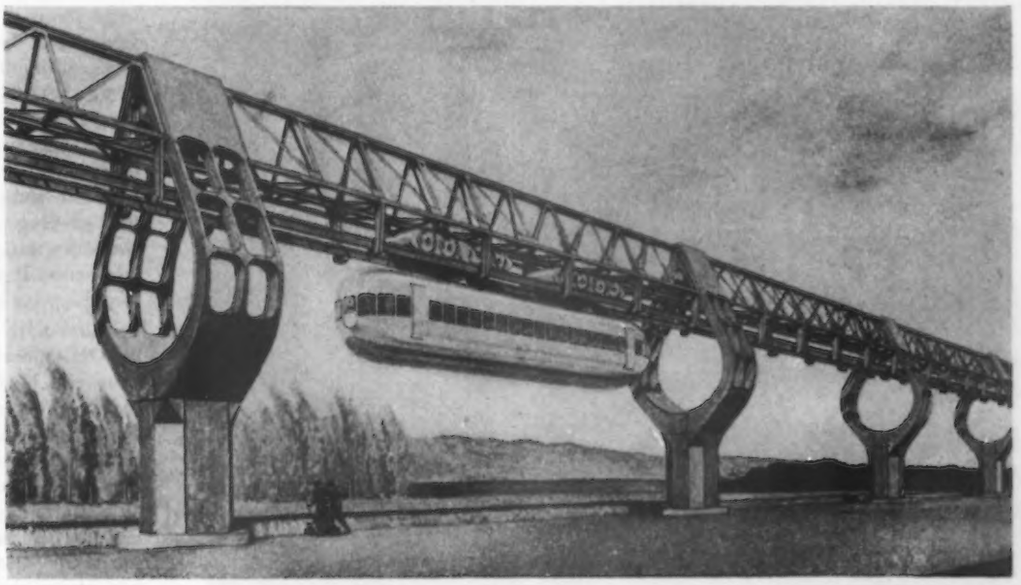
When a tool block is returned to the crib, an inspector checks all principal dimensions, rejecting the tools and gages that are worn beyond given limits and ordering replacements when necessary. After inspection the tools are greased and placed on the proper shelf, ready for immediate use.

turned to the crib and another tool block, needed for the next operation, is withdrawn when the parts are scheduled to move to the next operation.

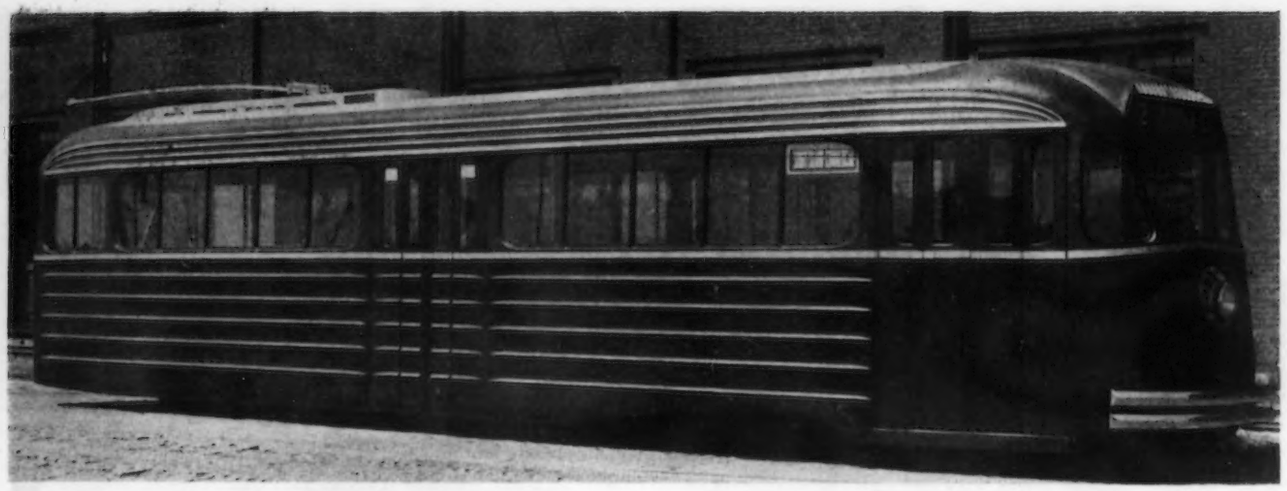
Permanent Tool Withdrawal Records Furnish Pertinent Data

As each tool block is withdrawn from the tool crib it is charged to the production department to which it is destined. An old practice was to place a card, properly marked, in a file. When the block was returned the card was removed and destroyed. Thus no permanent record of the use of the tool was kept. A new plan employs a form which contains pertinent data concerning a given serially numbered tool. This is kept as a permanent record. On it are indicated the date each time the block was taken out, the department to which it was delivered, the date returned to the tool crib and comments by the inspector. This card will show in the future how often the tool has been in the production department and also how often it needed tool room repairs and whether it has been corrected as per latest change order on the part.

As each tool block is returned from a production department it must first go to the inspector before being stored on its shelf. It is the inspector's duty to check all principal dimensions and see that all tolerances are observed. He must make note of wear, and reject tools or gages that have worn beyond given limits. When the inspector has finished his work, the block has its full quota of tools and after proper greasing by the attendant, it is placed on the shelf with the assurance that when again needed, it can be used on very short notice and that all tools and gages will be in proper condition to perform work of the desired accuracy.



THIS drawing by Joseph B. Strauss, chief engineer of the Golden Gate Bridge now under construction at San Francisco, is a design for an air tram system to solve the traffic problems for both of San Francisco's new bridges. The trams will be capable of traveling at 100 miles an hour with safety, and the system will include Merin, Alameda, San Francisco and San Mateo counties. Photo by Keystone View.

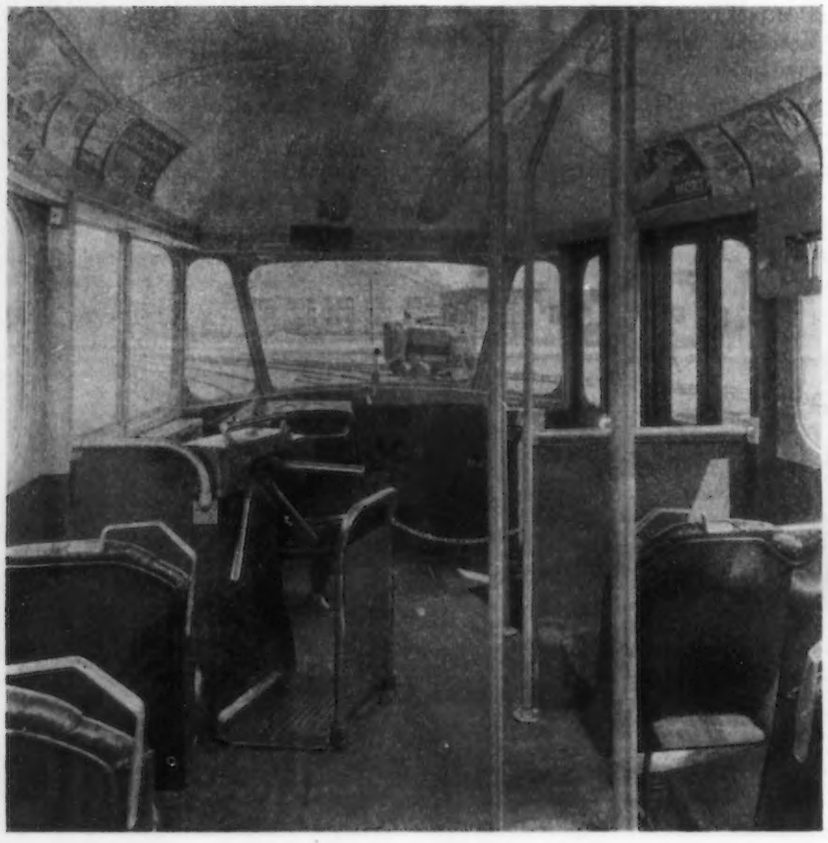


Structural members of the car are made of Cor-ten steel. By the use of standardized sub-assemblies, cars can be built economically of different lengths or widths, be given different truck centers and door arrangements and be made single or double ended. Welding is used throughout, with the exception of the bottom part of the sides or "skirt."

▲ ▲ ▲

The car is roomy, with stanchions, hand rails and grab handles arranged for greatest convenience of standing passengers. Motor-driven fan provides ventilation, air in moderately cold weather being taken in over the motor resistors, heat from which otherwise is wasted.

▲ ▲ ▲



DETERMINATION of street railway executives to regain lost patronage is resulting in special attention being given to new street car design, with emphasis placed on comfort to passengers, reduction of noise, safety, speed, operating costs and construction costs. To determine what the public wants and what it does not get in the older type of equipment, a survey was made by the Electric Railway Presidents' Conference Committee.

As an outcome of this investigation, several experimental cars have been built and one car in Brooklyn has been reconditioned and equipped with new-type noiseless trucks. Of special interest, however, is a car designed under the direction of C. F. Hirshfeld, chief engineer of the Conference Committee. This car was built in the Chicago shops of the Pullman Car & Mfg. Corpn. It represents the result of tests of modern cars of conventional design and a study of features that would suit the greatest number of car lines operating in this country. It is contemplated that the new car can be put into semi-mass production, thereby lowering its cost in contrast with the older designs which are essentially custom-built jobs.

The car is designed for one man operation, with entrance doors at front and exit doors at the center. An exit door can be fitted at the rear, if desired. The seating capacity is 47. Four 50-hp. motors are used with control for single-end operation. A single trolley is provided. Lighting is indirect to avoid shadows and glare, and 10-ft. candles are available on the reading plane of seated passengers. Trucks are designed with rubber springs and resilient wheels and are comparatively

And Now the Light-Weight Street Car

By ROGERS A. FISKE
Western Editor, The Iron Age

noiseless. Structural members are made of pressings of Cor-ten steel, a product of the United States Steel Corpn.

Principal dimensions are as follows:

Length over body end sheets	44 ft. 9 3/16 in.
Length over body end bumpers	45 ft. 3 3/16 in.
Length over eaves	42 ft. 9 7/8 in.
Length between truck centers	21 ft. 9 in.
Width overall	8 ft. 4 7/8 in.
Width inside of car	8 ft. 1/2 in.
Height rail to top of roof (empty car)	10 ft. 3 5/8 in.
Height rail to top of floor (empty car)	2 ft. 7 in.
Height floor to ceiling duct	6 ft. 9 in.
Diameter of wheels	2 ft.
Wheel base	6 ft.

The weight of the new car as delivered is 31,400 lb. Older designs ran as high as 50,000 lb., but in recent years this has been reduced to 40,000 lb. Now the weight has been lowered about 8500 lb. by the use of special steel structural members and a new truck design, and, in general, by the employment of the lightest materials and equipment consistent with low first cost and satisfactory maintenance expense. The lighter weight, of course, will result in operating economies.

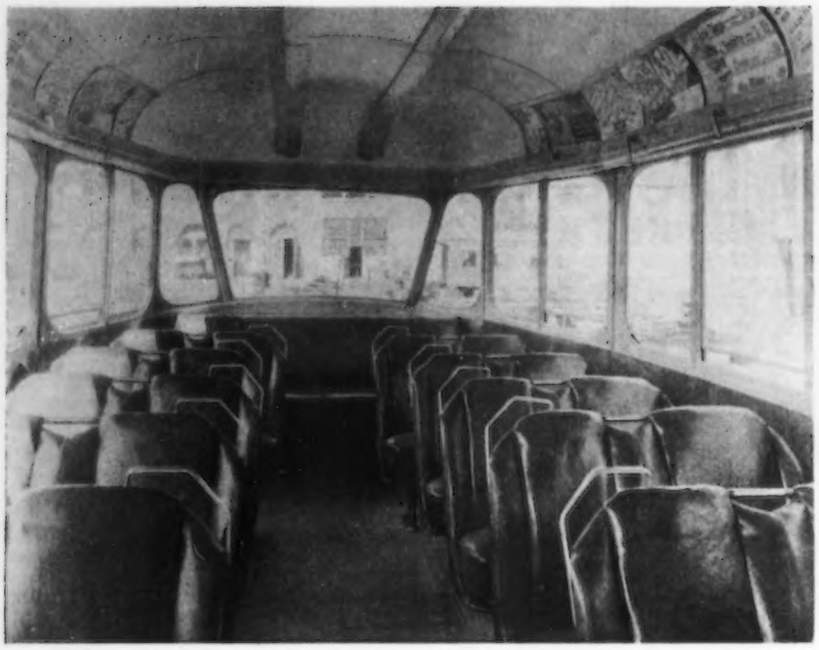
The first cost of street cars is of vital importance. High investment per car means difficulty in financing and a long period for amortization. With the rapid progress being made in the improvement of competitive equipment, it was not believed that any solution of the design problem would be satisfactory if it did not include provision for greatly reduced car investment.

This aspect of the situation has been handled by providing in the design for the greatest degree of standardization consistent with legitimate variation in the requirements of different companies. The method adopted was the use of standardized sub-assemblies which can be assembled to produce cars meeting the requirements of different operating companies. In this way cars can be made of different lengths or widths, can be given different truck centers, can be made single or double ended and can be given different door arrangements while still using standardized sub-assemblies.

DETERMINED to regain lost patronage, the Electric Railway Presidents' Conference Committee has designed a new street car made of Cor-ten steel and built in the Pullman company's shops. The car is constructed of standardized sub-assemblies and can be put into semi-mass production, thereby lowering manufacturing costs. Because of its light weight, the car can be operated speedily and economically. Welding is used to improve the car's external appearance. Trucks are of special design to eliminate noise and weight. New methods of lighting, heating, ventilating and interior arrangement are employed to give passengers maximum comfort.

As previously mentioned, all structural members on the car body are made of Cor-ten steel sheets. Most of these are pressed into structural shapes, though some cross members in the floor frame are channels made from a sheet to which are spot welded two pressed angles. Side and end sills are of similar construction, as are the posts and carlines. Side and roof sheets are made of this special steel. The floor base in ¾-in. plywood covered with 3/16-in. Masonite, which is also used for the side and part of the head lining. Johns-Manville insulation is used between the floor and the window sills.

The trucks are of special design to eliminate noise and weight. The motor frame, to which various steel members are attached, is a part of the truck structure. The side frames are of tubular construction, and no steel springs of any kind are used. Improved riding qualities and great reduction of noise have resulted from the use of rubber springs and resilient wheels. Journal boxes are made of fabricated sheet steel and have at each side a vertical cylindrical section welded to the box. Vulcanized in each cylindrical section is a rubber cylinder through which passes a vertical bar attached to the side frame. The rubber cylinder is also vulcanized to this bar. Therefore, no slip occurs between either the inclosing cylinder and the bar, or the bar and the rubber.



All seats face forward so as to give maximum comfort to passengers, in view of the high rate of acceleration and deceleration for which the car has been designed. Seats have divided cushions upholstered with machine-buffed leather. Lighting is indirect to avoid shadows and glare. Ten-foot candles are available on the reading plane of seated passengers.

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Experience so far indicates that the life of these rubber springs may be from five to eight years, inasmuch as they are not subjected to oil, sunlight or overload. Bolster springs follow the design just described.

Wheels are of the sandwich type, employing two rubber disks. A steel plate, containing dowels, is vulcanized to each side of each rubber disk, one of which is mounted on each side of the wheel web which does not touch the wheel hub. This assembly is compressed between two steel disks, one of which is permanently attached to the hub and the other forced into place by a nut moving on threads on the hub.

Welding has been used throughout the new street car, with the exception of the bottom part of the sides, or "skirt," which has been riveted. It has been found that this part of the car is most subject to damage in collisions and wears out faster than other parts. Under existing conditions it can be replaced more easily if it is riveted rather than welded to the car body.

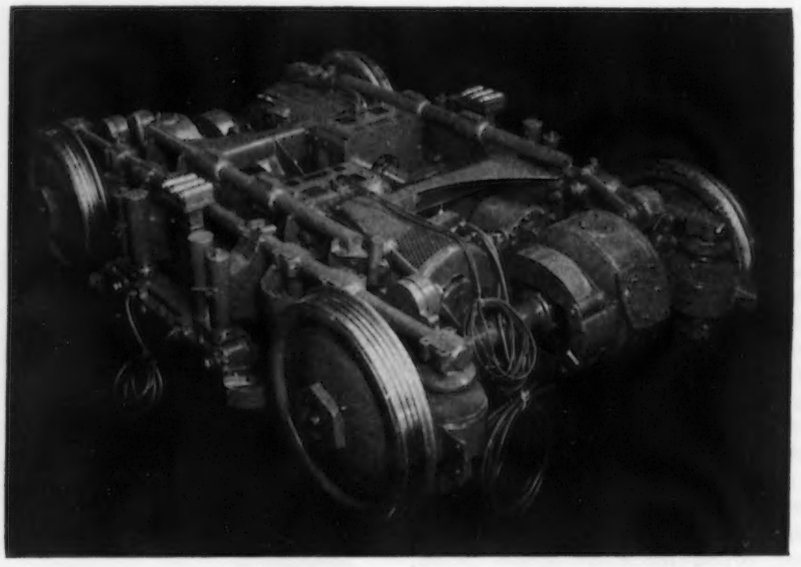
One reason for the use of welding is to improve the car's external appearance. Prof. Hirshfeld points out that the conventional street car of the past has looked like a series of pieces pinned together. The new design, adapting the general design of the motor vehicle, gives the impression of unity, strength and beauty.

Ventilation is accomplished by a motor-driven fan. In summer, air is taken from the outside. In moderately cold weather air will be taken in over the motor resistors, heat from which is otherwise wasted. When colder weather comes, electric heating elements will be turned on. These are located in the discharge air ducts between the fan and the car interior. Under these conditions part of the air in the car will be recirculated. All heating is by convection, there being no radiant heating units.

All stanchions, hand rails and grab handles are arranged for greatest convenience for standing passengers. Seats have divided cushions and are upholstered with machine-buffed leather. All seats face forward so as to yield maximum passenger comfort with the higher rates of acceleration and deceleration for which the car has been designed.

Experiments showed that acceleration up to 4¾ miles per hr. per sec. is not uncomfortable if the acceleration is smooth. Accordingly special controls are used. The maximum free running speed is 42 miles per hr. Service braking deceleration conforms to the 4¾ miles per hr. per sec., and emergency brakes decelerate at 8 miles per hr. per sec. or more. The brake system is the General Electric Co.'s eddy current type arranged to operate in conjuncton with magnetic track shoes and hydraulically-operated drum brakes.

The braking feature is considered important for safety and as a factor in maintaining fast schedules. In order to hold its place in fast traffic, this car must accelerate in accordance with the standards set by the modern automobile. Likewise it must have braking facilities comparable with those of the automobile in order to enable the car to give speedy service and to avoid accidents.



Comparatively noiseless trucks are designed with rubber springs and resilient wheels. The motor frame, to which various steel members are attached, is a part of the truck structure. Side frames are of tubular construction. No steel springs are used. Journal boxes are made of fabricated sheet steel, having at each side a vertical cylindrical section welded to the box.

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Production Problems in Enameling Iron and Steel

By LeROY W. ALLISON and MALCOLM B. CATLIN

IN the technical sense of the nature of the material, enamels really are glasses. They are composed of silicates, borates and fluorides, which melt at comparatively low temperatures and have fairly definite physical and chemical properties. In a general way, these characteristics are comparable with those found in glass—both products are brittle, relatively chemical resistant, have certain temperature range conditions, and so on. These properties, of course, are developed variously in particular cases, depending largely on the application of the finished product.

The problem of manufacturing good porcelain enameled ware is quite different, naturally, from that of glassware production. The enamel glass must be made to fuse rigidly and accurately to a metal, and at a temperature sufficiently low to eliminate any possibility of softening the base material. In this process, metal and glass are inextricably interrelated, and it is important that the properties of both be well understood.

This is equally true for cast iron and sheet steel, as well as for all types of enamels. Consequently, up-to-date enameling practice has brought about rigid control over all factors relating to raw materials, whether base metal or the enamel frit. Enameling plants constantly are exhibiting greater refinement in control tests for the physical and chemical properties of the materials, with similarly improved efficiency in control methods for processing operations. Product tests, likewise, have been developed to serve not only as inspection standards, but as accurate guides as well, for detecting possible sources of error in manufacture.

While all porcelain enamels are similar in nature (silicate glasses, as noted), they differ widely in actual practice according to the ultimate conditions under which they are to be used. The exact character of service has a primary bearing in the selection of materials and enameling plant procedure. With the large and constantly expanding variety of porcelain enameled iron and steel products, this can readily be understood.

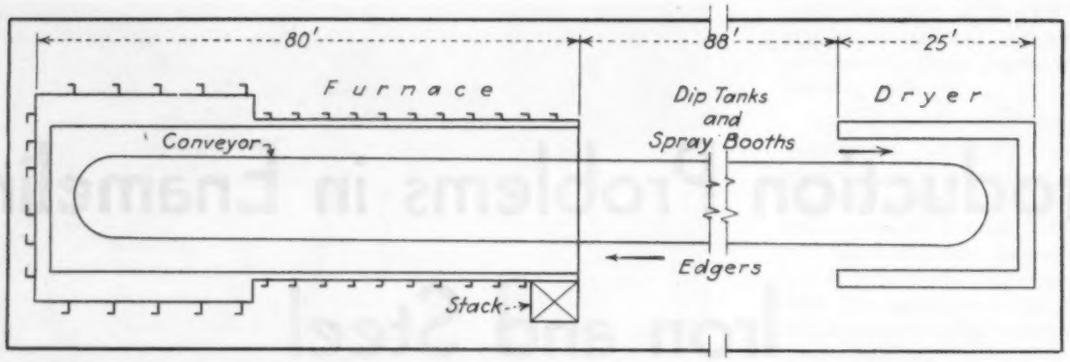
For instance, enamels used for outdoor displays and signs, as well as those for more recently developed exterior architectural purposes, must have the ability to resist the action of atmospheric agencies in retaining their original colors for many years without deterioration; such enamels, likewise, must not chip or craze through normal wear or the inevitable expansion and contraction accompanying the changing seasons of weather, for such failure in cover coats would expose the underlying metal to the elements.

On the other hand, one of the most rigid restrictions applying to cooking ware enamels, for example (entire freedom from harmful chemicals as might be absorbed by foodstuffs), does not obtain at all with enamels intended for outdoor service. Similarly, these architectural enamels, as they may be termed, while designed necessarily to resist the relatively slow "working" due to continual weather changes, are not required to withstand the severe shocks brought about through rapid heating and cooling, as in the case of enameled cooking ware, stove and range parts, and the like.

Intimate conditions of normal and abnormal service must be determined fully and accurately with such enameled iron or steel products as bathtubs, sinks, barber chair parts, wall panels, lamp shades and numerous other specialties. Certain enamels, such as those employed for sinks, table tops, pots, pans and so on, must be able to

ROUNDING out a series of articles on enameling, both rolled steel and cast iron, the authors in the accompanying concluding discussion touch on the parts played in enameling technique of the base metal as well as the composition of the enamels. Such process troubles as blistering, black-specking and re-boiling come in for some consideration.

The first two articles of the series appeared June 21 and July 5 and were devoted to the remarkable growth of the enameling industry in both the dry and wet process fields. The next two articles were published in the issues of Sept. 6 and 13 and focused particularly on porcelain enameled buildings, including the place in the scheme of things of the enameled steel house.



The enameling plant of the Detroit-Michigan Stove Co. illustrates what may be called the typical layout.

resist the abrasion of scouring powders to a reasonable degree, as well as mechanical shocks through impact of falling dishes or other articles; again, they must withstand the action of fruit acids, cleaning compounds, etc., that otherwise would result in permanent surface stains. Dealing with other enameled wares, such requirements as these may not be of any importance whatever for satisfactory utility.

From this brief outline of some of the varying conditions of service, it is evident that the enamel ware manufacturer is confronted with the fundamental problem of developing enamels most effectively to suit the work and purpose for which the particular product is intended. This means literally the introduction of every possible variable from the composition of the base metal and enamel frit to the unpredictable human factors entering into any complicated fabricating process. It demands constant application and attention to detail from raw material to finished product.

The remarkable growth of the enameling industry in recent years, has brought increasing cooperation of all factors concerned—producers of iron and steel for this line of output, manufacturers of frit or individual composition materials, and the enameler. Some of the exceptional developments and accomplisments to date can be traced readily to this joint cooperative effort. Today, the steel and iron mill constantly is calling on the enameling plant for technical information and research that will work to the best interests of all concerned, assisting to develop and perfect the best base metals for porcelain enameled products.

Porcelain Enameling of Two Main Classes

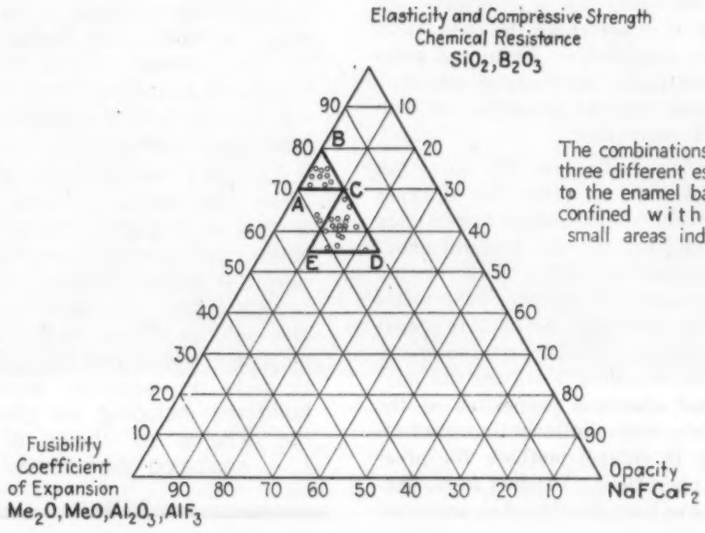
The porcelain enameling industry may be divided into two main groups, (1) plants producing enameled articles fabricated from relatively thin sheets of iron and steel, and (2) plants manufacturing cast iron enameled products. The enameling of other metals, such as gold and copper for jewelry and decorative purposes, is an older and quite significant branch of the industry, but hardly to be considered in this digest of mass production of general porcelain enameled products.

Considered briefly, the fundamental operations or flow of material in a porcelain enameling plant consist of forming the product, either by casting or by pressing and punching, as the case may be; cleaning the rough piece of ware by sand-blasting and pickling; applying the first or ground coat of enamel; drying and firing the product at this stage; applying the next or cover coat; and finally, firing of the piece a second time, followed by inspection, sorting, packing, shipping, etc.

Porcelain enameling differs distinctly from other types of metal-finishing, such as japanning and galvanizing, in the firing processes. Enamels are melted on the metal under an intense heat, almost sufficient to fuse the base material itself. While practice necessarily varies for different enameled products, the average firing temperatures in a sheet steel or iron enameling plant range from 800 to 900 deg. C., for the first coat of enamel, and from 750 to 850 deg. C., for the second enamel coat application. On the other hand, the initial coat of enamel on cast iron is fired generally at 900 to 1000 deg. C., as may be required, and second or cover coats on such material, from 800 to 900 deg. C.

The first or ground coats of enamel usually are applied as a wet liquid, either by spraying, dipping or slushing, as the case may be. Cover coat application differs; enamels on sheet steel generally are handled wet, while those on cast iron are applied as a dry powder, which adheres firmly to the hot ground coat, the application being made at this stage of the process. Again, firing practice and equipment for this purpose vary to suit the character of product or bulk of output, and other controlling factors of production.

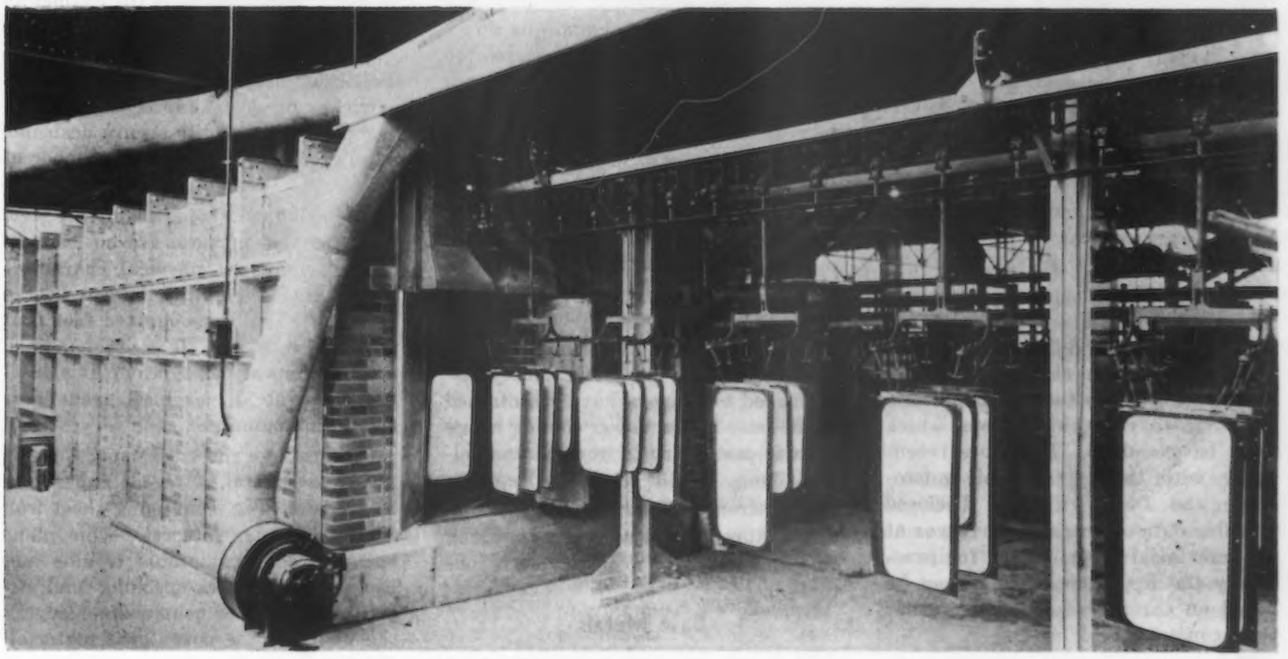
Bathtubs and similarly large enameled pieces are fired in box-type furnaces, with the use of enameling forks for handling the ware both in and out of the furnace unit, first for the ground coat firing and immediately following, for cover coat applica-



The combinations of the three different essentials to the enamel batch are confined within the small areas indicated.

tion. Smaller products, such as cooking ware and the like, are fired generally in continuous-type furnaces, the material being moved through the unit on mechanical conveyors.

The entire enameling operation requires but a comparatively short space of time. In general practice the enameled pieces are air-cooled with reasonable speed and are then ready for cleaning and subsequent routine handling. Continuous furnace units offer a certain amount of retarded cooling during the firing process, but this can be calculated readily for the final cooling of the ware, which is developed with desired rapidity.



Ferro continuous enameling furnace at the plant of the Florence Stove Co., Kankakee, Ill.

Number of Enamel Coats

At least two, and frequently three coats of enamel are applied both for cast iron and sheet steel products. The first or ground coat provides the metal base with the actual protective coating, as readily understood, and were it not for the demands of appearance, this initial enamel application would be quite sufficient for average conditions of life and wear. The second or cover coat gives the opaque white, or color finish, as may be desired, accurately concealing the metal and the undercoat of enamel, and allowing, as well, for any necessary artistic treatment of the finished product.

As a matter of fact, no little effort has been directed to the problem of developing a ground coat of enamel that would in itself provide the desired white or colored finished surface. The saving in material and processing costs would be considerable, as a large part of required plant processing would be eliminated automatically. In Germany, particularly, there have been numerous attempts in this direction; some of these have been fairly successful but far from the ultimate, indicating, however, possibilities in the future.

Technical enamelers have found it no simple matter to perfect an enamel frit and process to cover a metal surface effectively and yet adhere to the base material properly. To date, at least, the experiments have not brought the desired attainments, and in consequence, the second or cover coat continues as standard practice in all commercial enameling operations. These two enamel coatings generally are sufficient in the case of darker colors. To obtain a good white finish, as well as lighter shades, a third coat of enamel frequently is necessary. Further, decorative motifs, numerals, legends, trade-marks, etc., to be executed in porcelain enamel, involve additional applications and operations, but these in general follow the lines of the initial coatings and ordinarily present no unusual problems, excepting possibly for some special artistic embellishments or individual features of certain finished ware.

The difficulty in developing a single enamel coat combining both protection to and essential covering of base material would go to indicate that the functions of the two enamel coatings are not alike. After years of practical enameling, experimentation and technical discussion, the exact behavior of the two enamel coats has not been definitely determined to general understanding and mutual agreement. Enamel chemists certainly are not in accord with their views on this particular subject. It is quite evident, however, that the initial enamel coating takes a vital part in causing the liquid enamel to adhere properly to the metal base under heat influence, acting at the same time as a more or less elastic interlayer between the metal and the succeeding cover coat.

Enamel Adherence to Metal Base

Enamel ground coat adherence to steel or cast iron, or other base metal, is a subject constantly under technical discussion, presenting a basic problem that has concerned enamel technologists for many years. It is a rather contested topic in enameling theory. Enamelers of earlier days did not realize the importance of the ground coat in connection with adherence to metal base, believing that the function of such coating was to prevent the carbon in the iron from reducing the zinc oxide used to render opaque the cover coat of enamel.

Later on, however, when it was found possible to make enamels opaque with other, and non-reducible materials, the fallacy of this theory was evident. For instance, if the only function of the ground coat was to protect the zinc oxide, as intimated,

the use of other oxides would have assisted materially in solving the problem of the one-coat enamel; but in this it was found impossible to make the cover coat alone adhere to the surface, and the importance of the ground coat as a bonding interlayer became more and more apparent.

Further trial and error proved that cobalt and nickel oxides were highly essential chemicals in bringing about proper adherence of ground coat, and while most of the theories offered in explanation have proved rather erroneous, cobalt and nickel remain as primary components of every ground coat enamel composition. Recent findings indicate quite clearly that these materials are indispensable for this purpose. It should be noted, however, that they function only to certain amounts for any given ground coat. In other words, beyond such point, it is not possible to improve adherence by increased content of these chemicals.

Investigation of enamel adherence to metal base has been hindered in the past through the difficulty in ascertaining the exact chemical reaction that takes place between enamel and iron, due to the thin sections which must be examined. But more recent study with the petrographic microscope and the X-ray has disclosed valuable data of actual occurrences at the interfacial layer. Thus, for practically the first time, theory may be based on careful observations rather than conjecture.

These investigations have shown that during the fusion of the enamel to the metal base and the subsequent cooling, alpha-iron crystals are developed within the enamel, and it is quite likely that this needle-like structure, as formed, tends to unite the metal and glass, or at least gives definite aid in that direction. Steel manufacturers are familiar with this character of metal absorption and the subsequent precipitation of the metal from the melt. The reciprocal oxidation and reduction reactions taking place between iron and other metals in open-hearth slags is a case in point.

Further studies of the manner in which these alpha-iron crystals are formed in the enamel and the effect of commercial enameling processes on their development present a research project of considerable importance. It is possible that the secret of ground coat adherence will be shown to exist in the control of the formation, size and distribution of these crystals. Factors distinctly affecting such formation would be governed by ground coat enamel composition, nature of base steel or iron, temperature and rate of firing, and rate of cooling.

In regard to the latter, many experienced enamelers have maintained in the past that a slower cooling range than is customary in general enameling plants would go far to improve the adherence to the enamel coating, and future technical findings along this line may tend to justify such contention.

Base Metals

It is not so many years ago that sheet steel enamelers encountered much difficulty in obtaining suitable base material—sheet steel of essential physical qualities to withstand the heavy action of punching and pressing, and the strains imposed by rapid heating and cooling in the enameling process. As a result, the percentage of defective ware was considerable.

Through the active research and cooperation of different steel mills, this picture has been changed entirely. Suitable base stocks have been developed to meet all standard demands, and sensing the possibilities, a number of the larger mills now specialize in sheet steel especially for enameling service. At the present time, despite greatly increased requirements imposed by deeper drawing and more intricate product shapes, the enameling plant can readily secure desirable steel stocks from a sizable number of sources.

The chemical properties of the steel used for this purpose are no less important than the physical characteristics, as is generally known in the industry. It is a recognized fact that steel and iron, as well as other metals, suitable for various types of finish will not serve at all for high grade porcelain enameling.

To illustrate the vital importance of good base metal, a recent experience of an enameling shop using sheet iron is of particular interest. This plant encountered considerable trouble and loss through black-specking and reboiling of ground coat enamel during the firing of the cover coat material. A casual check of processing procedure indicated no lapse in customary

Transferring work to and from conveyor and edgers at the plant of Detroit-Michigan Stove Co., Detroit.

The continuous gas-fired dryer, United States Stamping & Enameling Co., Moundsville, W. Va., continues through the wall into the pickling room.

care in cleaning, dipping and firing operations. It became evident that a thorough investigation would be required. The large number of variable factors involved made necessary a complete study of the different phases of production.

The ground coat enamel was checked to ascertain if of right type for the purpose, if correctly milled and applied in proper thickness—all factors that might lead to the source of the difficulty if neglect was evidenced. The cleaning of the base metal, as well as drying and firing of ground coat likewise were investigated; the sheet iron was checked as to source, gage, etc. Elimination of these different operations one by one, following careful inspection, finally disclosed that the source of trouble was in the base metal being used.

Sheet iron from three different sources showed defects, while such material from three other mills indicated no such difficulty as had been experienced. Further check was made by a trial run, in which the various iron samples were enameled and fired under identical conditions. Rejects with the material showing inherent defects through previous analysis, ran to 38 per cent, while with the acceptable sheets these averaged only 8 per cent. While proper gage is of extreme importance in base metals to be enameled, the thickness of material in the case at issue was not at fault; the heavier stocks developed as much trouble as those of lighter gage.

Similar experiences in connection with cast iron have shown enameling shops of this character that the composition of castings is of great importance in the production of good ware. Foundries have learned that the cupola charge must be analysed carefully for the development of proper castings for this nature of finished product. Improper casting composition may lead readily to blistering, black-specking and other serious enameling defects. Scrap metal employed must be reasonably clean, and chemically the cupola mix must measure up to certain definite requirements for later effective enameling.

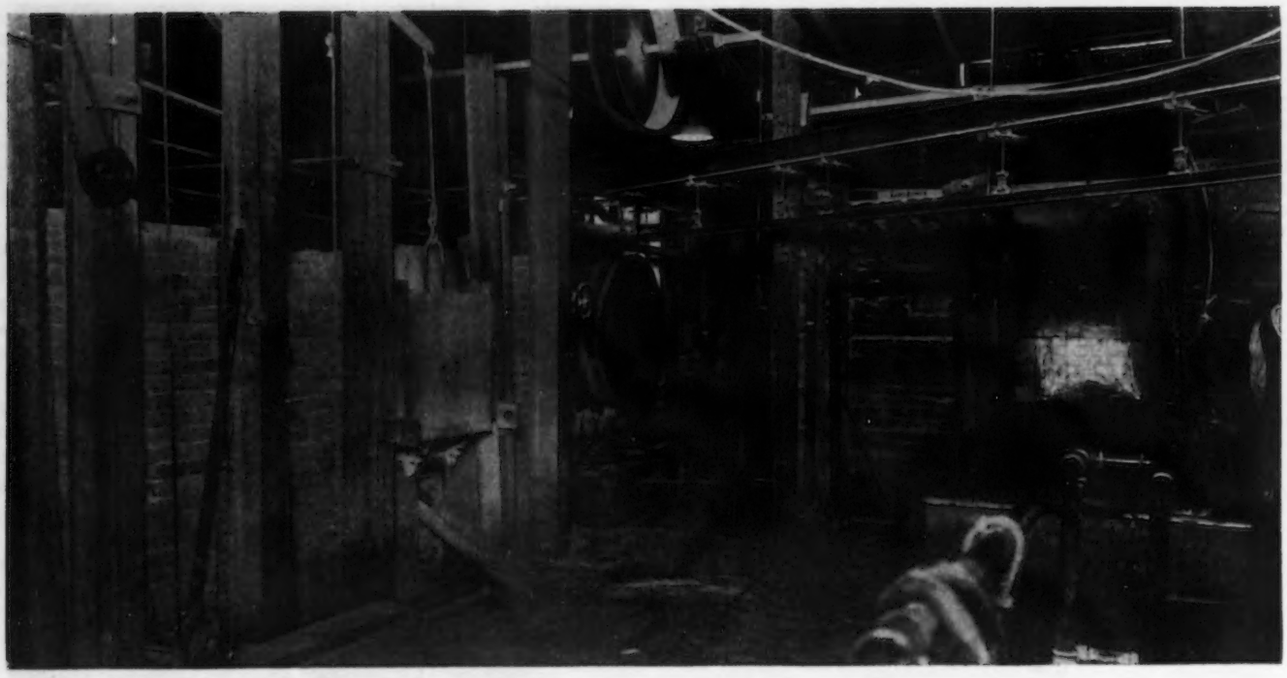
Standardized and accurately controlled cupola practice is recognized today as the starting point of good cast iron enameling, the three most important factors being a careful anallyis of the cupola charge, kind and grade of scrap metal employed, and grade of pig iron used. Stove manufacturers, among others, have learned through experience, sometimes costly, that castings applicable to japanning are not at all suitable for porcelain enameling processes.

Enamel technologists have been giving considerable study recently to the subject of proper base metals, as a result of the apparent relation to such costly enameling troubles as blistering, black-specking, re-boiling and other more minor difficulties. That many such troubles are purely physical is quite evident from findings to date.

Adequate pickling of raw metal shapes is another matter of prime moment in the preparation of surfaces for enameling. Shop dirt, rust, drawing compounds, grease and other exterior blemishes for perfect surface must be removed. Proper thickness of base material, as well as uniformity of thickness, are other important considerations in designing the shape and contour of the product. If one part of the material is thicker than another, it is not likely to heat up as rapidly as it should in the furnace, with the result that the enameled coating at that point will not be fused completely or properly.

Where welding is employed, seams should be developed as near as possible to the thickness of the main part of the product shape, so as to prevent under-heating of the enamel at the joints. Ware design, as evident, should be perfected to avoid sharp corners and what may be termed, raw edges, as the enamel mix will have a tendency to run thin at such points, likely exposing the metal or showing a color difference.

These are some of the fundamental factors, briefly stated, that are well recognized today as essential guides to successful enameling practice, illustrating the definite necessity for comprehensive understanding of raw materials and their characteristics. As previously noted, porcelain enameling



Frit smelters and rotary dryer at the plant of the United States Sanitary Mfg. Co., are gas fired.

involves considerations that are not at all significant with other types of metal finishing.

Blistering With Cast Iron

The problem of blistering has been one of particular concern to cast iron enameling plants. The defect, apparently, is related to the base metal employed, although some enamel technologists maintain that this trouble is due to gases evolved from the enamel itself, and entrapped when the material hardens. Latest studies indicate this phenomenon to be developed through the presence of certain carbon compounds close to the surface of the casting, these uniting with the oxygen in the furnace gases to produce gases which blister the enamel.

Certain iron seems reasonably free from harmful amounts of this particular form of carbon, others show evidence in concentrated form at the surface only, while again, there are iron castings with such character of carbon well distributed throughout the unit. In the latter case, the removal of the surface layer by sand-blasting is not very effective.

Research shows that it is likely that the total volume of gas evolved from the iron in this way is not so important in causing blistering, as is the fact that it matures at a critical point in the enamel fusion. Moreover, and rather unfortunately, it appears that the same conditions responsible for this harmful and annoying blistering effect may also promote the desired adherence of the porcelain enamel to the metal base.

As a result of recent investigation, Emerson Poste, enamel consultant, has concluded that the most desirable type of iron for enameling service is one relatively high in silicon (2.6 per cent). It should not analyse more than 0.8 per cent sulphur, will contain phosphorus dependent on the pig iron used, about 0.5 to 0.6 per cent manganese, and not over 3.4 per cent total carbon. With good foundry practice, this compositional guide should produce non-blistering enameled iron. Such character of raw material, it is pointed out, is being employed successfully for the manufacture of enameled stove parts. Change in silicon content to suit different total carbon content might be essential for other types of castings to be enameled.

Bubbling

Plants given over to sheet steel enameling have been troubled considerably with another serious defect, which may or may not be related to blistering, just discussed. This has to do with the re-boiling or bubbling of the ground coat, frequently occurring during the firing of the succeeding cover coat. The bubbles develop dark spots, impossible to eradicate or to conceal, even with a number of subsequent cover coats. It is maintained by some enamelers that the definite solution of this major problem would go to assist practically all other enameling difficulties encountered in processing, neglecting those relating to shapes and colors, which are rather individual in themselves.

As in the case of blistering, there is a decided difference of technical opinion as to the source of the gases apparently responsible for the bubbling. Some enamelers maintain that these gases emanate from the metal base, while others hold that the enamel, itself, causes the gas formation. Further, there are students of the subject who believe that the gas development individually is not so much the trouble as is the physical expansion of the gas due to corresponding physical stresses under the action of the furnace.

A special committee was organized recently by the American Ceramic Society for the sole purpose of thoroughly investigating this important problem, and some definite findings and recommendations are anticipated in the near future.

Enamel Batch and Composition

Good base metal alone is only a phase of good enameled ware, for the proper compounding of the enamel glass is of equal, if not still greater importance. While it is comparatively simple to devise a batch that will resemble an enamel, the development of accurate enamel glasses, capable of meeting the demands of commercial manufacture and every day service, is quite another matter. It is decidedly a complicated art, requiring real skill and knowledge of the technique.

Accordingly, many enameling plants, and some of the largest shops among

them, do not attempt to mix their own enamel batches, but purchase such mixes, or enamel frits, as they are known, from companies specializing in this line. These producers have extensive plant facilities for quantity manufacture under perfected technical control. The enamel frits are compounded by smelting accurately proportioned chemicals, quenching the molten mass in cold water, followed by drying and grinding of resulting material. This dry ground powder, or frit, contains the necessary basic enamel glass ingredients.

The enameling shop purchases this frit in quantity, storing and using the material from day to day as required. All that is necessary to make up the batch is the addition of a small amount of clay and water in proper proportion to float the frit, together with certain essential chemicals to produce opacity and color. This mix is ground in ball mills and is ready for immediate application. There are four general types of enamel frit on the market, these being ground coat frit, ordinary white cover coat frit, acid-resisting white frit, and colored frit, respectively.

The most important characteristic of porcelain enamels is that of fusibility. Yet silica, a material exceedingly difficult to fuse, is the basis of all enamels. To bring this material (silica) within fusion ranges commercially practicable, it is necessary to add other raw commodities, or glass-forming materials, to it. These include boric acid, soda, potash, calcium oxide, red lead, magnesia, feldspar and other products.

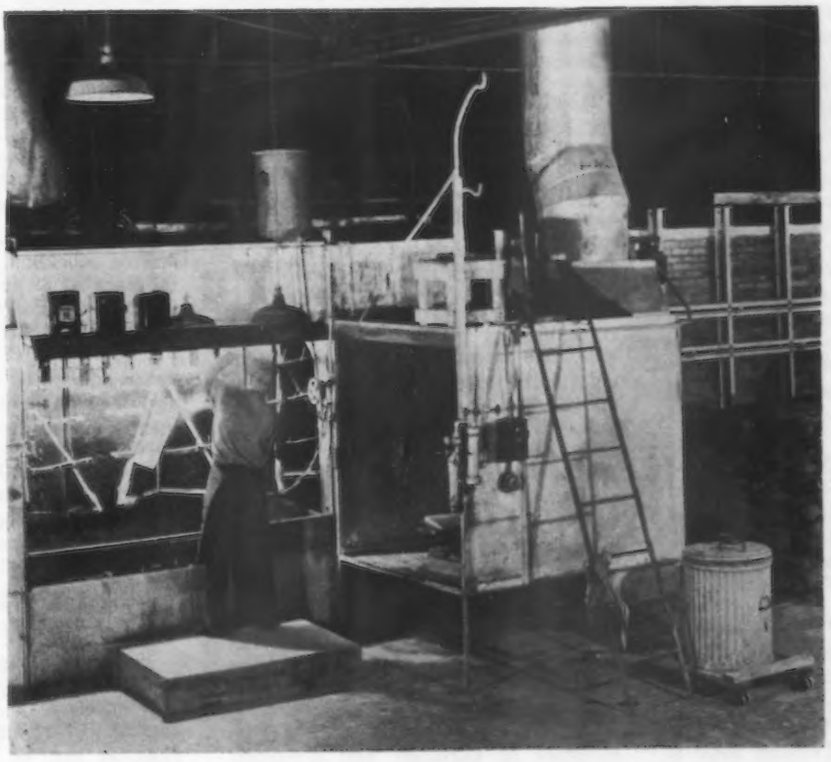
To effect proper adherence of the frit to the metal base before actual firing, still other materials are added to the batch, with characteristics distinctly for this or other definite service, having no glass-forming properties. These additions are made either in compounding the frit, or later, when the frit is milled with water and clay, as the case may be. Thus, cobalt and nickel oxides promote adherence; saltpeter is used as an oxidizing agent; zinc oxide, antimony oxide and other materials are included in cover coat batches to provide opacity. Further, there are the coloring oxides, such as copper oxide (which develop reds and green-blues), chromium oxide (green), titanium oxide (brown), cobalt oxide (blue, blue-black), and so on. Combinations of these oxides give additional color shades.

As is quite apparent, all of these materials impart to the enamel glass their own specific characteristics, physical as well as chemical. Again, the matter of proportion is an important one, and definite quantity must obtain. A given material, for instance, may be effective in making the enamel more fusible, yet too large an amount might lower the resistance of the enamel to sudden temperature change beyond a desirable point, or may make the material too sensitive to chemical attack.

In the early days of porcelain enameling, the exact behavior of the various materials to be used in the batch was not well known, although considerable empirical knowledge was available. As the industry developed, certain combinations giving fairly satisfactory results were worked out by trial and error methods in enameling shops, so that the enameler's art reached quite a highly perfected status, despite a definite lack of scientific understanding of the basic principles involved. Practical enamelers, having developed a frit or batch which could be used with reasonable ease and dependability, were rather content to continue on such a basis. The material could be expected to provide an enamel with desired properties, and there seemed no need to investigate further.

The fact that enamels are compounded from a rather large number of oxides makes for an equally extensive variety of possible combinations. As a result, in time past, literally hundreds of formulas were developed by different methods, showing only slight variation from one another, and each representing an effective and workable enamel. Much secrecy obtained with many of these batch compositions in former days, but time has changed the picture.

Modern glass chemistry has gone to reveal considerable information concerning silicate reactions, the compounds formed and their properties, the extent to which the nature of the glass developed can be predicated from the materials utilized, and so on. All of this has been of pertinent value to the metal enameling industry. It has been the trend of modern enamel research to define the fairly narrow compositional limits of enamel ingredients, beyond which workable porcelain enamels cannot be developed with the qualities required by the practical operator.



Operator sprays the work as it passes opening in dryer of the vitrifying furnace of the Florence Stove Co.

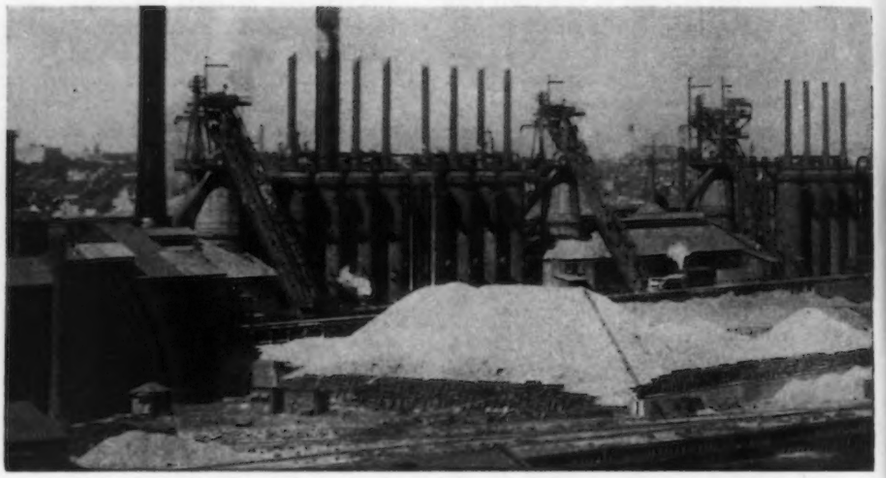
As a result of research and development, it is now possible to classify enamel raw materials according to their function with some degree of accuracy, and at the same time derive intimate knowledge of their relation, correspondingly, with steel and iron base products.

In general, the raw materials can be divided into three classes: (1) Foundation or matrix ingredients, giving refractoriness and chemical resistance, and of which silica is the most important; (2) Fluxes,

(Continued on Page 76)

MEYERS—NIGHT

By T. H. GERKEN
News Editor, The Iron Age



Steel Merger

Many Small Stockholders Are Being the Proposed Republic-Corrigan,

THE era of mergers in the iron and steel industry came to a rather abrupt close in 1930. However, the possibilities of advantageously joining certain large units in the industry were by no means exhausted. Such plans have centered largely at Cleveland and when it was announced on Aug. 27 that directors of the Republic Steel Corpn. and the Corrigan, McKinney Steel Co. had agreed upon terms for the merging of these two organizations, the element of surprise was generally lacking. To most persons, it seemed quite logical. In addition to the plans for consolidation, it was announced that stockholders of the Republic corporation would be called upon to approve the revamping of the company's financial set-up and later the acquisition of the Truscon Steel Co.

While the entire program would scarcely have been considered ambitious in the halcyon days of the twenties, the business of merging is not so simple today. Many interesting problems have arisen, and when the stockholders of the Republic corporation meet in special session on Oct. 30, either to approve or reject the plan, they will be writing history not only for the iron and steel industry, but also for industrial procedure generally.

Large Shareholders Cannot Decide

The proposed Republic - Corrigan, McKinney merger is not to be the type of consolidation which is agreed upon by a group of large shareholders seated around a conference table. This may be true in the case of Corrigan, McKinney, at least 90 per cent of the stock of which is controlled by a small group of persons. So far as Republic is concerned, the situation is different. The largest holding of Republic common stock by any one person or group consists of less than eight per cent of the 2,000,000 shares outstanding, while the remainder of the issue is distributed among 25,000 investors.

The holding of the preferred issue of approximately 600,000 shares is just as diversified. No one individual or financial institution controls more than 3 per cent of this stock and the total number of owners is 10,000. These two groups of investors are actually being given an opportunity to decide the future of their company. This feature alone makes the proposed merger unusual.

Another point of considerable interest is the fact that the Republic-Corrigan, McKinney-Truscon deal is probably the largest undertaken since the passage of the Securities Act of 1933, which many persons originally hailed as the death knell of industrial consolidation.

Financial Reorganization Important

Acquisition of the Corrigan, McKinney Steel Co. is no more important to Republic stockholders than the financial reorganization of the company, which they are being called upon to approve. The details of these changes in the company's financial structure were covered in THE IRON AGE of Aug. 30, page 32-b. Of particular importance is the provision creating a new class of prior preference stock, which will take precedence over the present outstanding preferred issue. Holders of the present preferred are being asked to accept one-half share of the new prior preference issue and two shares of common in exchange for each share of their current preferred holding. Accumulated preferred dividends on the issue already amount to $24 per share, a total company obligation of $14,000,000. Of course the new prior preference issue would be only slightly more than half as large as the present preferred issue and the possibilities of regular dividend payments on the new stock would be much better. At the same time, the possibilities of earnings and dividends on the common issue would be greatly enhanced.

Under the present financial set-up the company is not permitted to pay dividends on either the preferred or common issues until depression losses of $29,000,000 are made up. With the $14,000,000 in accrued preferred dividends, a financial burden of $43,000,000 has been saddled upon the company which must be taken care of before regular dividends can be paid on either stock issue.

The financial program now being offered stockholders also permits the issuance of $24,000,000 in convertible bonds, the proceeds of which will be used to retire the company's outstanding refunding and general mortgage bonds as well as to pay off bank loans and provide working capital for enlarged operations and for other corporate purposes. The retiring of such bonds and the repayment of outstanding notes will permit dividend payments on both the new prior preference and common issues as soon as earnings justify such action.

Stockholders Must Be Convinced of Benefits

The entire plan may seem a bit complex to many small stockholders. Nevertheless, their approval is essential. No one of the proposed changes can be made unless stockholders ratify them all. Although approval by holders of only two-thirds

The Corrigan, McKinney Steel Co. operates four modern blast furnaces at its Cleveland plant, which have an annual capacity of 800,000 tons. The ore unloading dock at the right could be used by the Republic Steel Corpn. for the transfer of ore to its inland plants.

▲▲▲

—1934 Style

Called Upon to Decide the Outcome of McKinney-Truscon Consolidation

of the preferred and the common stock is necessary to make the proposed changes, actual ratification by owners of a much larger percentage of the preferred issue is necessary from a practical standpoint. This is because the retention of a large block of the present preferred with its accumulated obligations would still leave the company's financial structure top-heavy with senior stock and greatly reduce the earning possibilities of the junior issue.

It has been left to the management of the Republic company to explain the advantages of the deal in such a way that stockholders will be willing to continue their stake in the company's future. This job has been further complicated by the provisions of the Securities Act of 1933, as amended this year. The new law requires the registration of all deposit receipts if outside assistance is resorted to in convincing the stockholders that the exchange is desirable.

In order to conform with this provision and at the same time to inform stockholders thoroughly of the desirability of the proposed financial changes and the Corrigan, McKinney and Truscon acquisitions the Republic company is utilizing the services of its entire sales department. This is a procedure that is probably unique in the steel industry. At the same time its logic cannot be disputed. The company's salesmen are unquestionably better informed regarding its current position and future prospects than any employees of brokerage or other financial institutions who would have to be hastily schooled in the affairs of the corporation. Perhaps a better opportunity has never been offered for a company to establish definite personal contacts with its stockholders and explain to them the potentialities of the property in which they have a financial stake.

Under the above circumstances the Republic company has found it advisable to acquaint the public with its current and future outlook in a much more thorough manner than is usually encountered in the steel industry.

Merger Thoroughly Practical

The Republic management naturally believes that the proposed merger is justified by practical considerations. It is not a "banker's way out." In the first place, the fact that the stock of the Republic company is held by such a large number of persons and is not concentrated in a few hands would preclude the possibility of banking control. The holder of ten shares of common or five shares of preferred must approve the merger just the same as the very heavy stockholder. The assent of the small shareholder is being sought just as actively as that of the large. Furthermore, it would certainly follow that if any benefits are to be had from the consolidation, they would be shared relatively by both small and large stockholders.

It is probably true that the holders of stock in the Corrigan, McKinney company would obtain securities which are somewhat more liquid than their present holdings. At the same time, the property which they are surrendering to the Republic corporation is apparently sufficiently well regarded by the latter company's management to justify the exchange. The same thing can be said for the proposed Truscon acquisition, which unquestionably offers many advantages to the Republic company as an annual outlet for as much as 350,000 tons of its finished steel.

The Enlarged Republic Company

If the properties of the Corrigan, McKinney and Truscon companies are acquired by Republic, the latter's steel ingot capacity will be increased to approximately 6,000,000 tons or about 11 per cent of the country's total. Possibly of more importance than the increased size would be the fact that the enlarged company would have a greater percentage of its plants on the Great Lakes than has the present organization. Slightly more than 25 per cent of Republic's capacity is now on the Lakes, but with the addition of the Corrigan, McKinney property, 40 per cent will be on water. The advantage of such location is obvious, although in the production of alloy steels, which is centered in the Canton and Massillon, Ohio, district, an inland site is equally desirable.

The acquisition of Corrigan, McKinney's ore and coal reserves would be of considerable importance to Republic's future. The company's 45,000,000-ton reserve in the Lake Superior ore district would be increased to 95,000,000 tons, while its coal reserves in Kentucky and West Virginia would be raised from 82,000,000 tons to 126,000,000 tons. In addition, Republic owns large deposits of both iron ore and coal in the Birmingham district. The Cleveland docks of the Corrigan, McKinney company would also be of considerable value to Republic, as they might be used for the transfer of ore to railroad cars for shipment to inland blast furnaces.

Balancing Capacity

The necessary balance between ingot and finished steel-making capacity has been emphasized during the depression. Corrigan, McKinney, with its ingot capacity of more than 1,000,000 tons a year, has been seriously handicapped in the past by a lack of finishing capacity as an outlet. This

was corrected to some extent by the acquisition of the Newton Steel Co. in 1932, but even including the N. & G. Taylor Co., its present finishing capacity is only about 750,000 tons a year. With Republic the set-up is practically reversed. Its finishing mills can turn out practically as much steel as its furnaces, and the combination would provide a very desirable balance.

Sheet and Bar Capacity Supplemented

The properties of Corrigan, McKinney would bring to Republic additional capacity for the making of bars, sheets and tin plate, all of which would supplement existing facilities, and, in some instances, with more modern equipment. Sheet and bar capacity would be added in almost equal amounts. However, the Newton sheet mills at Monroe, Mich., and Newton Falls, Ohio, permit the rolling of much wider sheets than Republic is now able to produce and would also add much needed facilities for full-finishing. At present Republic can roll sheets only up to 68 in. in width, while the Monroe plant can turn out material up to 84 in. wide, an important advantage in today's market. Only one continuous strip mill in the country can produce 84-in. sheets. The present sheet-making capacity of the Republic company, exclusive of tin mill plate, is approximately 600,000 tons, which would be advanced to 960,000 tons by the merger.

The Corrigan, McKinney bar mills, with a potential annual capacity of 370,000 tons, would increase Republic's annual bar-making capacity to approximately 3,000,000 tons. This might be considered excessive were it not for the fact that bars have long been the principal finished steel product from a production standpoint. Last year merchant and concrete reinforcing bars accounted for more than 17 per cent of total finished steel production and the country's bar mills have a capacity of 18,500,000 tons. These large bar-making facilities have been installed because of the wide diversity of uses for bar mill products. They are not only required in a large way by practically every large consuming industry, but also range in

(Concluded on page 67)

▲ ▲ ▲

ACQUISITION of Corrigan, McKinney and Truscon would greatly enlarge Republic's manufacturing map. It would concentrate 40 per cent of its ingot making capacity on the Great Lakes. Fabricating activity would be extended to the Pacific Coast through Truscon's plant at Los Angeles and wide sheet capacity would be added in the center of the automobile producing district. But the heart of the country's third largest steel empire would remain in northeastern Ohio, as shown in the smaller map. The map below locates major manufacturing activities of the combined companies, with principal products.

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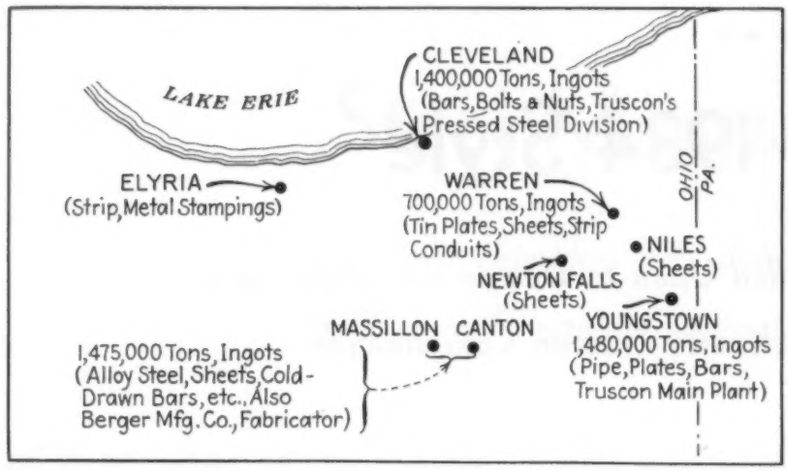
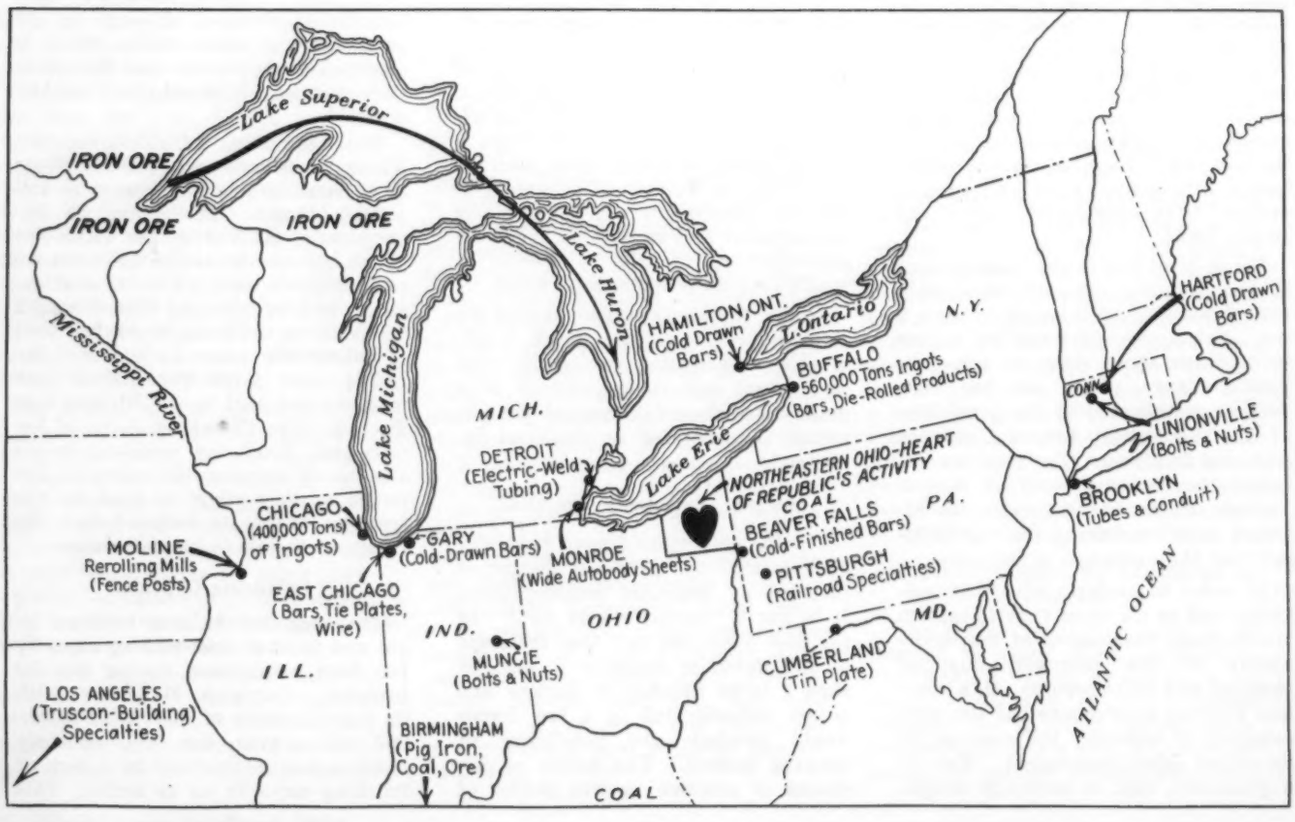




Ram-Type Turret Lathe Anticipates Future Tooling Demands

THE Jones & Lamson Machine Co., Springfield, Vt., is introducing a completely new universal ram-type turret lathe line built with 1½ and 2-in. bar capacity ratings. The new design-objective is the use of the latest types of cemented-carbide cutting tools with an ample margin left for future developments in that field; additionally, the factors of mechanism, convenience and accuracy necessary to the use of ordinary tools are embodied in the design. Two types of installed motor drive arrangement are available, as shown in the illustrations of the bar and chucking set-up on page 32.

Head stock and carriage gears are alloy steel, hardened and ground. All gears run in oil. Sliding gears are mounted on splined shafts and all shafts are mounted on anti-friction bearings.

A single lever dial selector indicates all speed changes. This one lever controls both the forward and reverse motion of the spindle and when moved to the neutral position an adjustable brake is automatically applied for stopping the spindle. The clutches and brake are of multiple-disk type. Twelve selective forward and reverse spindle speeds are provided, two ranges of which, 20 to 1000, or 40 to 2000, are standard equipment. This range covers cutting tool requirements from carbon steel to carbide. The entire headstock is lubricated with a splash and filter system having a visual oil gage on the front of the headstock. The main spindle is an alloy steel forging mounted on precision ball bearings set up under a predetermined load; its 8-in. flange has a taper pilot. The control panel for all electric equipment is located on the front of the headstock.

Bed of Double Box Construction

The bed is a double-box, ribbed casting with accurately machined shoulders extending the entire length of the bed to support and aline the headstock and the hardened ways, which are of steel and precision ground and are attached to the bed with vertical and angular cap screws spaced 4 in. apart. The hold-down screws enter blind tapped holes to present an uninterrupted bearing surface for the carriage and saddle. Leveling screws are provided in each leg.

Heavy universal bridge-type construction is used for the carriage. T-slots in the front and rear of the carriage cross-slide permit multiple cross-slide tooling; a square turret on the front, controlled by one lever, and a dovetail tool-slide on the rear is standard equipment. The carriage apron, provided with a feed reversing lever and a safety-friction clutch, has sliding gear transmission, controlled by a single lever. Nine variable longitudinal and cross-feeds are available, the longitudinal ranging from 0.005 to 0.100 and the cross-feed from 0.0025 to 0.050 per spindle revolution. Carriage and ways are lubricated automatically by a force feed pump within the apron. Manual trips as well as automatic stop and dog disengagements are provided for feed movements. Taper attachment bolts to the rear of the carriage; thread chasing attachment installs on the carriage apron.

Ram-Turret Heavily Constructed

A hexagon turret with faces bored, counterbored and drilled is indexed from one position to the next with a star wheel, and is equipped with an automatic clamp ring. The return movement of the slide unclamps the turret and indexes to the next position, while the forward motion automatically clamps the turret. There are six adjustable stops, and a lever on the saddle permits hand indexing in either direction. The turret slide is of heavy-duty design, has hardened bearing plates, adjustable gibs for side adjustment, and hardened hold-down gibs. The turret apron is similar in construction to the carriage apron and is equipped with nine variable feeds controlled with a single lever dial selector; the range of feed is from 0.005 to 0.100 per revolution of the spindle. A force feed pump is incorporated also in the turret apron. The feed is through rack and pinion, and is either automatically disengaged or manually tripped.

Cutting coolant is piped to the turret through the center pin and is distributed automatically to each turret face when indexed to cutting position; a convenient front lever shuts off all coolant supply.

The collet chuck has a master collet for removable jaws. The bar feed mechanism permits the operator to stand at a normal operating position for chucking and feeding operations. The stock carrier can be ratcheted with a single lever for the next feeding operation while the machine is running.

A choice of motor arrangement is offered—flange-type motor mounted integral with headstock or motor mounted in cabinet leg, driving through multiple V-belts.

Small Surface Grinder Has Simple Knee-Action Table Control

SIMPLICITY of construction, with "knee-action" table control, is an outstanding feature of a new small surface grinder being placed on the market by the Diamond Machine Co., Providence, R. I. The table rests directly upon a ground plane surface on the bed and is guided longitudinally and laterally (no intermediate table) through the application of this knee-action to machine feed; lever and hand-wheel provide the means as shown in the illustrations on page 33. The bed is a heavily-ribbed box-type member. The upright is provided with three liberal ways on which the saddle is moved by hand-wheel for positioning the spindle, which is carried in a housing attached to the saddle by hinged bearings amply guarded. After a course adjustment of the wheel to the work, the saddle is clamped rigidly to the upright and thereafter, a fine micrometer-graduated feed is utilized for stock removal. The spindle has plain front taper bearing and rear ball and radial thrust bearing; an automatic spring take-up adjusts both bearings. The spindle drive is by V-belt with automatic tightening device. Specified capacity, using a 7-in. diameter by 2-in. face wheel, is 8-in. longitudinal and 4-in. transverse travel; in this range the wheel will clear the table platen, which has one T-slot for ⅜-in. bolts.

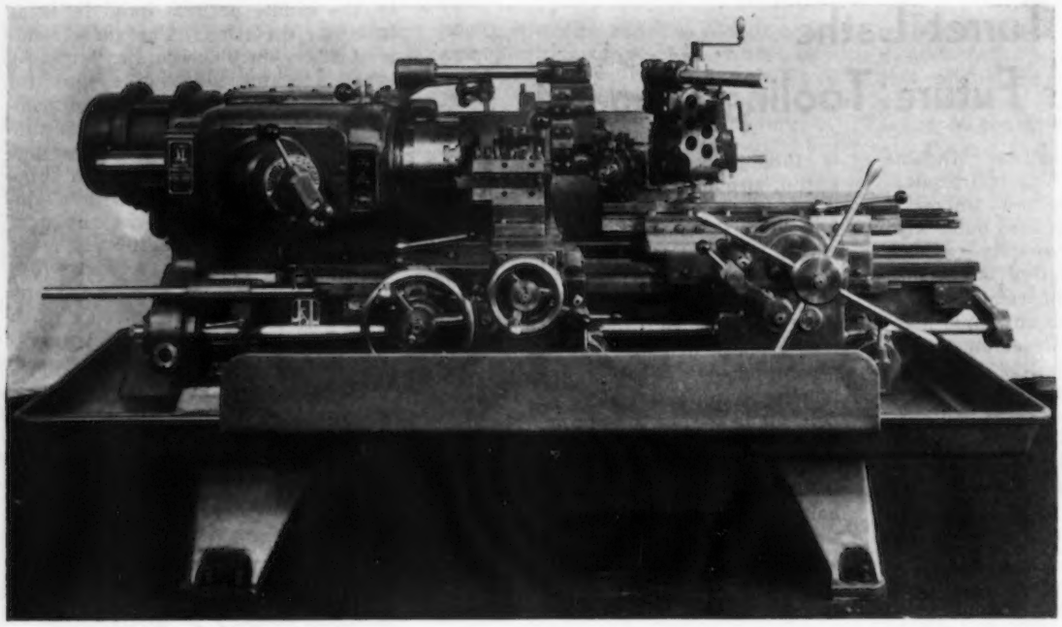
The motor used is ¼-hp., 110 volts, 60 cycles, single phase, standard make, 1725 r.p.m., constant speed. Motors of 1/3 or ½-hp. of any current characteristics may be used for greater stock removal. Either bench or column type machine is standard.

Pattern Shop Lathe Has Motorized Headstock

NEW variable speed lathes designed by the Oliver Machinery Co., Grand Rapids, Mich., for pattern shop metal spinning, electrical winding and other uses employ a new motor headstock and controller of unit design. The adjustable-speed alternating current motor, 110 or 220 volt, employed is said to be built exclusively for the Oliver company. The No. 51 K lathe of this line is shown on page 32.

The motor-headstock-controller unit

(Continued on Page 34)

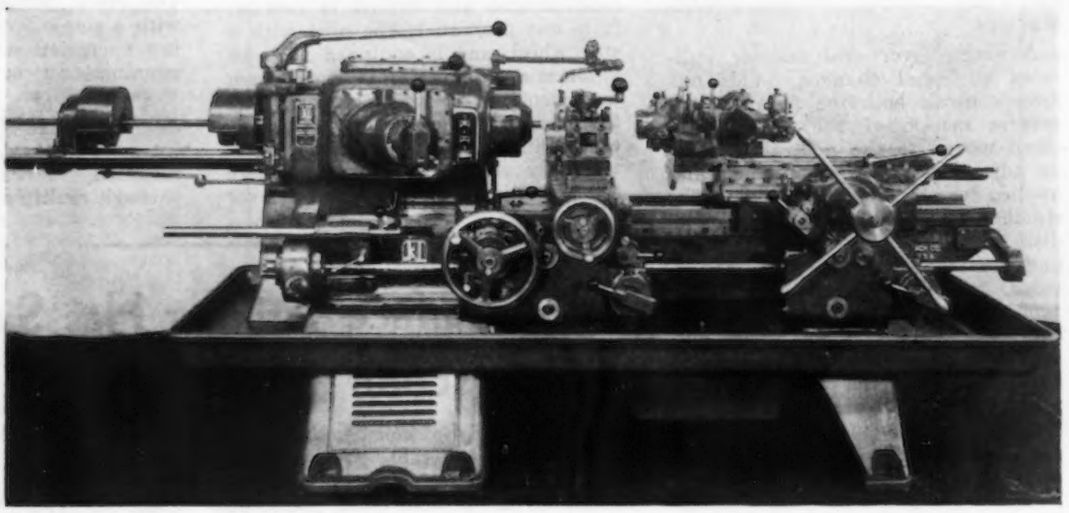


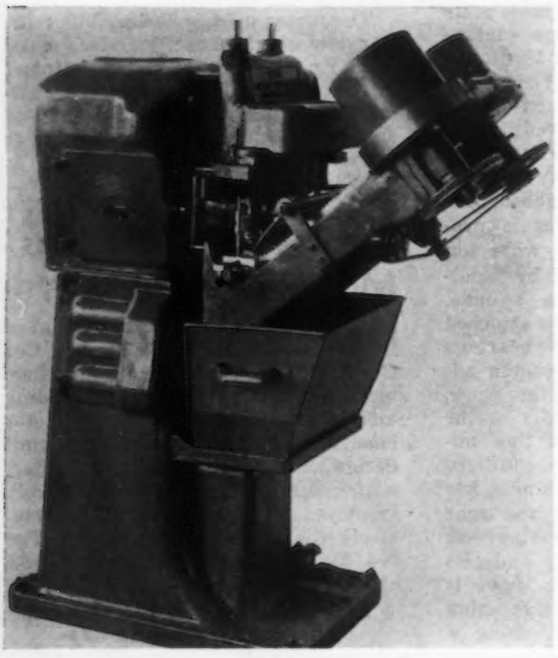
AT LEFT

DESIGN attention has been given by Jones & Lamson to the possibilities and to the probabilities of carbide tool cutting as well as to the fact that shop equipment should qualify for the use of cutting tools made from any type of metal cutting material. The cut shows motor on headstock drive. Chucking job.

AT RIGHT

STRENGTH, control of individual units and smoothness of action, combined with time-saving adjustments, giving only such travels as may be necessary, are pointed out as accomplished objectives in the new ram-type turret lathe. The cut shows motor installation in cabinet leg. Bar set-up. See page 31.



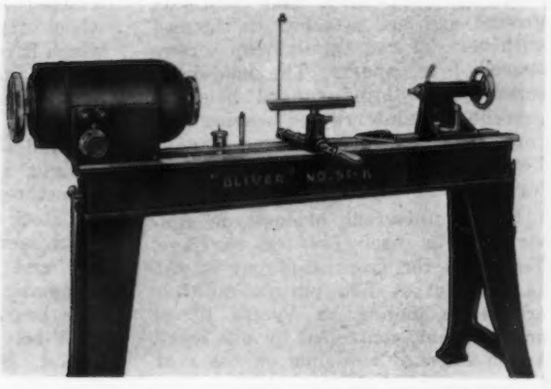


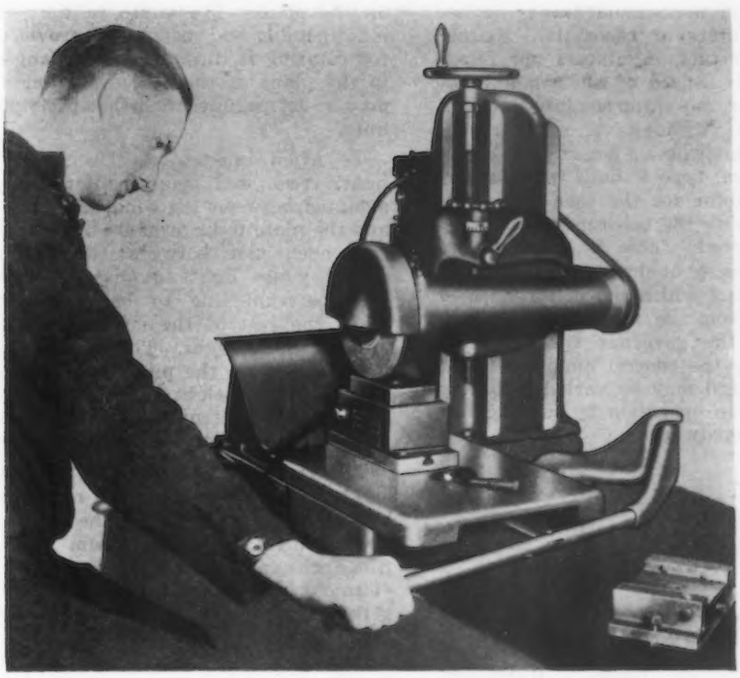
AT LEFT

SMALL work in large quantities is tapped on this Globe multiple tapper, equipped for rotary hopper and six chute feed, as described on page 35.

BELOW

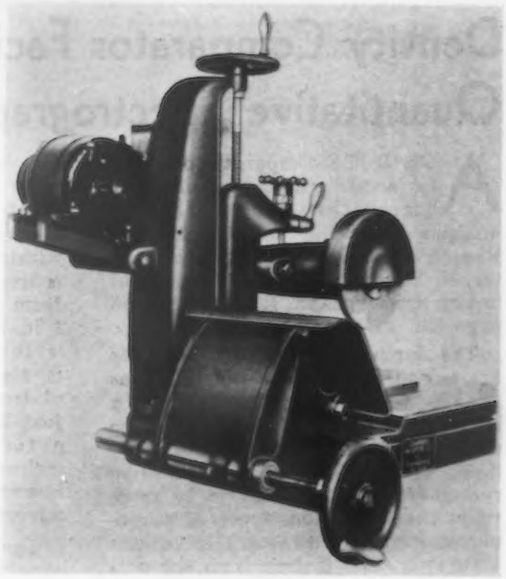
MOTORIZED headstock features this new Oliver pattern lathe, which can also be used for metal spinning and electrical winding. Specifications are given on page 31.





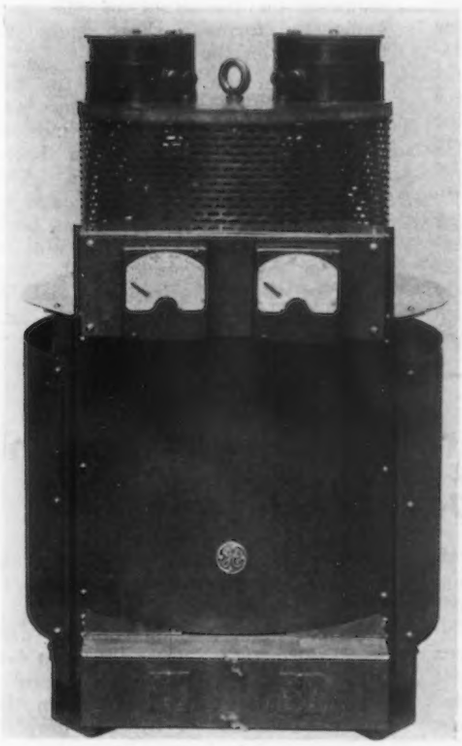
ABOVE AND AT RIGHT

KNEE-ACTION control in this Diamond surface grinder is said to make possible machine simplicity as evidenced in these cuts. For example, there is no intermediate table. After the wheel is approximately and rigidly located to the work, the amount of stock removal is determined through micrometer handwheel adjustment. These and other features are outlined on page 31.



BELOW

TRANSFORMER units, electrodes and automatic welding heads and controls are included in the General Electric line of A-C welders. The 750 amp. transformer unit is shown above. As pointed out in the description on page 34, absence of magnetic blow in the arc results in high quality welds.



AT RIGHT

WITH this new Bausch & Lomb accessory for any make of spectrograph, the intensities of spectrum lines can be read directly from a scale. The regulating transformer maintains a constant voltage and effects from stray light beams are avoided as is double imagery. These and other features are described on page 34.

(Continued from Page 31)

is equipped with self-alining ball bearings of sufficient capacity to carry a 4-hp. radial load and 1-hp. thrust load. Spindle locks to facilitate remounting of work on the faceplate is incorporated, as well as a brake, operated by push button for quick stopping of the headstock. The motor, of the single phase, series-compensated type, will operate on any single or polyphase circuit of proper voltage and can be furnished for any frequency from 25 to 60 cycles. The cover on the left or rear end of the unit is removable for convenient inspection. The wiring from the main line to the motor comprises two wires only, due to the avoidance of a multiplicity of wires incidental to the use of regulators or rheostats. Neither field rheostats, regulators nor relays are used. Speed of 600 r.p.m., 3600 r.p.m., or any intermediate speed is available through a conveniently placed handwheel. A governor of the centrifugal type is built in as a part of the motor for the sole purpose of maintaining the constancy of any selected speed. This is accomplished by increasing or decreasing the intervals during which the motor receives energy from the main line; the tension of the governor spring is adjusted by the control handwheel; the motor speed may be varied while the motor is in operation by turning this control handwheel.

Density Comparator Facilitates Quantitative Spectrographic Analysis

A DENSITY comparator designed to facilitate accurate and rapid quantitative spectrographic analysis is being offered by the Bausch & Lomb Optical Co., Rochester, N. Y., as an accessory instrument to any spectrograph. It is pictured on page 33.

The intensities of spectrum lines are measured by photoelectric means and the results read directly from a scale. For work involving the measurement of but a few selected lines, which is usual in quantitative spectrography, it is said to be more rapid than recording types of microphotometers. It measures intensities accurately, and is free from the personal equation and the effects of fatigue on the part of the operator. Computations can be made without waiting for the development of a photographic paper or film. The instrument may be used for plates taken with any spectrograph.

Complete equipment consists of a projection system, a photoelectric cell for reception, a voltage regulator, and a sensitive galvanometer mounted on a Julius suspension. The standard unit is for 110 volt, 60 cycle alternating current, but provision is made for other voltages and frequencies.

The illuminator, within the housing, consists of a 200 watt monoplane filament lamp with reflector, and is focusable. Compensation for variations in line voltage is accomplished by means of a regulating transformer which will maintain a constant voltage of 115 volts, even though the power line voltage varies from 105 to 130 volts.

Double Imagery Avoided

The spectrum plate is mounted on a mechanical stage which in turn is carried by a horizontal guide on the front of the instrument, directly between the illuminating chamber and the projection lenses. Horizontal and vertical adjustments are provided. A condensing lens system with a heat absorbing filter, mounted within the housing between the light source and the plate, provides uniform illumination over an area about 1 in. square. Outside of the housing is the projection lens system which is also focusable, and with the aid of two mirrors, one of which is adjustable, throws a magnified image of the illuminated area onto the large inclined white screen. Double imagery is avoided by the use of first surface mirrors.

The projected image is bright enough to be visible in an ordinary lighted room. This arrangement permits easy selection of a desired line by its position relative to the adjacent lines of the spectrum. The light from the projected beam passes through a narrow vertical slit in the inclined screen and falls directly upon the photoelectric cell constituting the first element of the receptor system.

This slit is narrower and shorter than the projected image of a spectrum line, so that when the latter is brought into position over it, the only light reaching the cell is that which has passed through the spectrum line on the plate. The width of the slit is adjustable and means are provided for rotating it through a small angle in the plane of the screen so that it may be set parallel with the spectrum lines.

To avoid interference from stray light, two red glass filters are mounted between the condensing lens and the plate to be measured. A narrow open slot between the filters allows white light to pass through the spectrum line to be measured while the rest of the field is illuminated with red light. Thus the entire field as seen on the projection screen is sufficiently bright for the inspection of the spectrum and easy selection of the lines to be measured.

The receptor system consists of a single Weston Photronic cell mounted behind the narrow slit on the screen, upon which the light beam falls. Since the photronic cell is of the voltaic type and is thus capable of generating current, no auxiliary source of power is required. The current which is on the order of a fraction of a microampere, actuates a reflecting galvanometer of high sensitivity. The galvanometer is provided with a suitable damping resistance to make it dead-beat.

Galvanometer deflections are read on a translucent scale, graduated in millimeters, just below the projection screen. A small target with an index pointer is mounted in an opening in the reflecting coating of the concave reflector, back of the projection lamp. Light from the lamp illuminates this target and is directed by a lens in the back of the main housing to the galvanometer mirror, by which it is reflected to the scale. This lens, in combination with a second lens mounted on the front of the galvanometer forms a sharp image of the target on the scale.

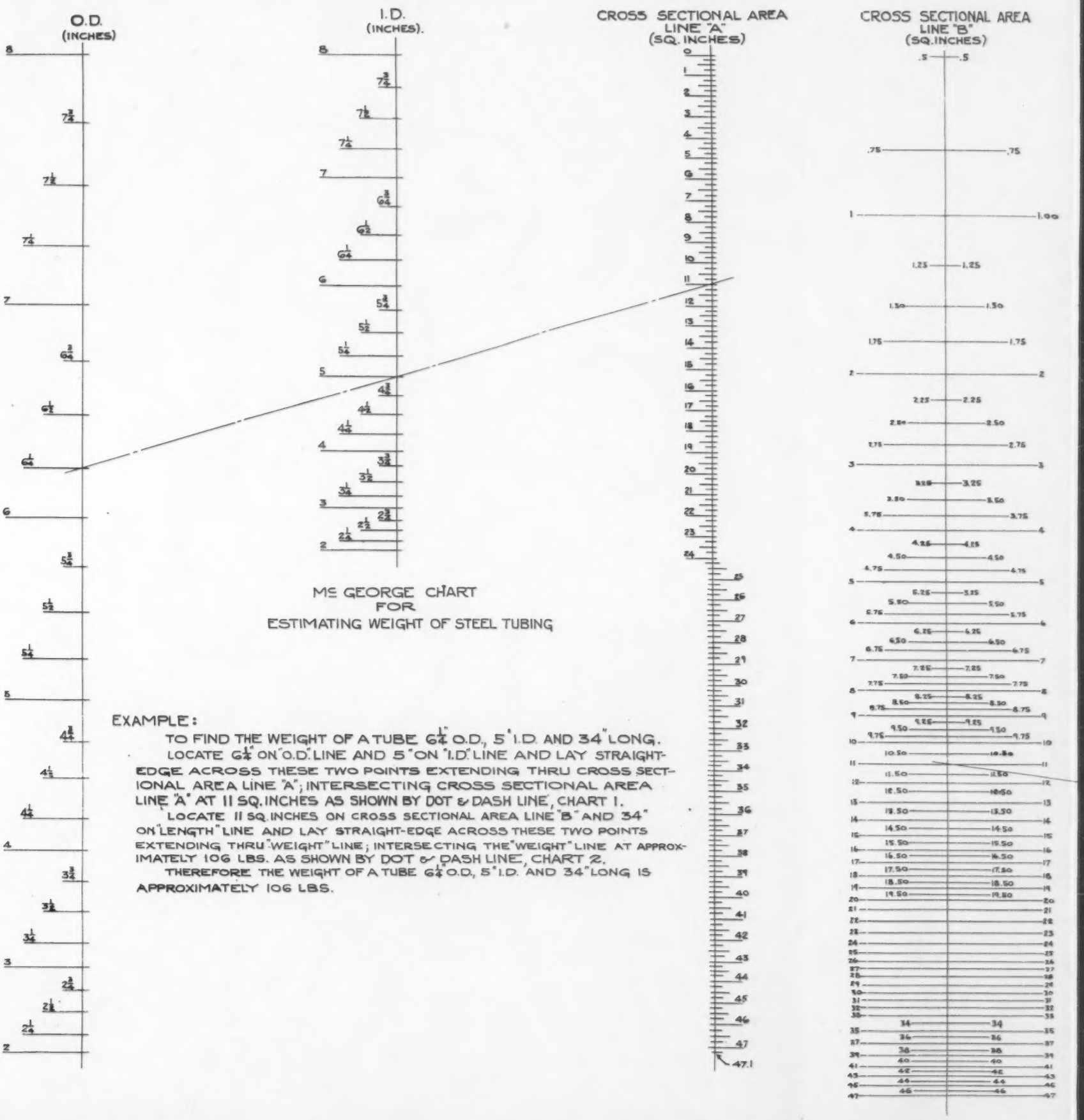
To obtain the expression for the density of a line two readings are necessary. The first reading is through the clear spectrum background adjacent to the line. The second after the projected image of the spectrum line or area has been positioned exactly upon the slit in front of the photoelectric cell. The ratio of these two readings is the expression for the density of the line or area.

Complete A-C Arc Welding Equipment Announced by General Electric

A COMPLETE line of alternating-current arc-welding equipment, including transformer units, electrodes and automatic welding heads and control, has been brought out by the General Electric Co., Schenectady. The new a-c. equipment is intended for heavy-current welding, primarily automatic, in shops where the welding location is semi-permanent.

Remarkable development in arc-welding electrodes during the last few years is said to have only recently made it possible to benefit from the major advantage of the a-c. process,

CHART 1



MC GEORGE CHART FOR ESTIMATING WEIGHT OF STEEL TUBING

EXAMPLE:

TO FIND THE WEIGHT OF A TUBE 6¼" O.D., 5" I.D. AND 34" LONG.

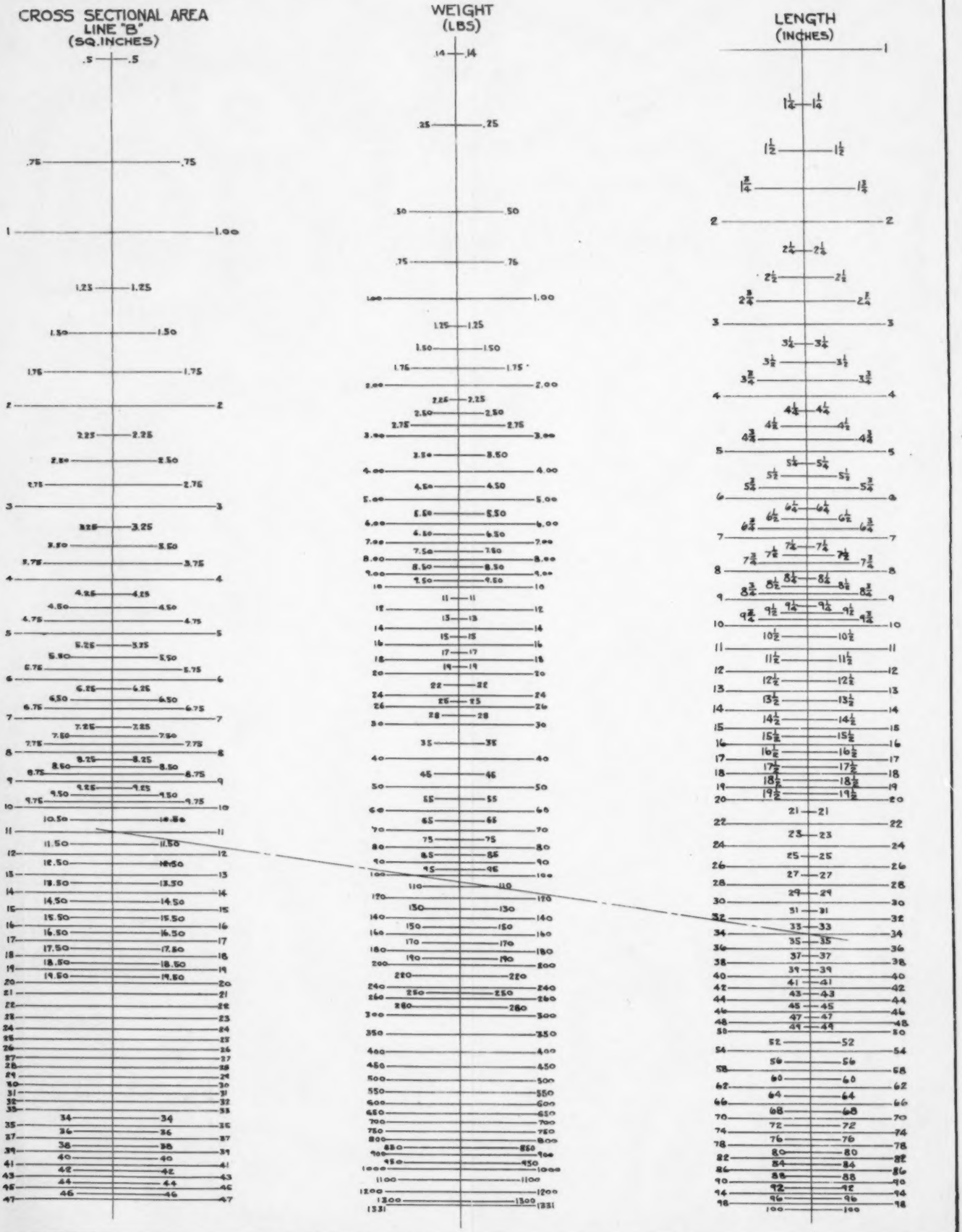
LOCATE 6¼" ON "O.D." LINE AND 5" ON "I.D." LINE AND LAY STRAIGHT-EDGE ACROSS THESE TWO POINTS EXTENDING THRU CROSS SECTIONAL AREA LINE "A"; INTERSECTING CROSS SECTIONAL AREA LINE "A" AT 11 SQ. INCHES AS SHOWN BY DOT & DASH LINE, CHART 1.

LOCATE 11 SQ. INCHES ON CROSS SECTIONAL AREA LINE "B" AND 34" ON "LENGTH" LINE AND LAY STRAIGHT-EDGE ACROSS THESE TWO POINTS EXTENDING THRU "WEIGHT" LINE; INTERSECTING THE "WEIGHT" LINE AT APPROXIMATELY 106 LBS. AS SHOWN BY DOT & DASH LINE, CHART 2.

THEREFORE THE WEIGHT OF A TUBE 6¼ O.D., 5" I.D. AND 34" LONG IS APPROXIMATELY 106 LBS.

Logarithmic Chart for Estimating Weight of Steel Tubing. Compiled by D. W. McGeorge, Oakmont, Allegheny County, Pa.

CHART 2


CROSS SECTIONAL AREA
LINE "B"
(SQ. INCHES)
WEIGHT
(LBS)
LENGTH
(INCHES)

that advantage being the absence of magnetic blow in the arc, resulting in high quality of weld. This advantage, it is pointed out, becomes particularly apparent with the heavier welding currents, above 250 amp., because of the greater magnetic effect at these currents. Slightly greater welding speeds are possible when using a-c., and in making fillet welds and in working into corners and other parts of intricate structures, the a-c. arc permits obtaining full penetration.

Three sizes of the new transformer units, having 1-hr. ratings of 500, 750, and 1000 amp. respectively, are built. Primaries are wound for 220, 440, or 550 volts; 60, 50, or 25 cycles; single phase. Extra attachments are available for reducing the secondary open-circuit voltage to approximately 50 per cent of its normal value, the normal being 80, 90, or 100 volts, and for obtaining currents down to 10 per cent of the 1-hr. rating.

The transformers are of the high-reactance type, air-cooled and enclosed in a sturdy cylindrical shell. Arrangement is provided to vary reactance so that the full welding range of the equipment can be obtained on any one of three secondary open-circuit voltage settings, the latter being selected by means of taps on the primary winding.

The electrode recommended is the company's heavily-coated type W-23.

New Tapper Has Multiple Chute Rotary Hopper

AN engineering conception of automatic, hopper-fed, production as now presented in the form of operating equipment by the Globe Tapping Machine Co., Bridgeport, Conn., is specified as particularly suited to rapid tapping, drilling, countersinking, threading and like work on single-hole parts. This special-purpose equipment, pictured on page 32, consists of a type-A Bridgeport tapper with two hoppers, six chutes and six ball-bearing spindles and was built for a special sleeve-nut having a 10-24 thread, 7/16-in. deep. From two revolving hoppers the nuts are fed down through the six chutes and are tapped and ejected automatically. Small parts of different types and sizes are handled by changing the chutes, and an adapter ring in the hoppers and by repositioning the adjustable spindles. These are so constructed that, in tapping, the tap follows its own lead, permitting the use of different tap sizes on the same machine and also the employment of commercial, straight shank, high-speed taps. The machine is equipped throughout with ball and roller bearings. The drive is from a 2-hp. motor, mounted in the base on a tilting plate, to a clutch pulley on the upper rear of the machine and then through a hardened and ground nickel-steel worm and a phosphor-bronze worm gear, both mounted on precision tapered roller bearings; heat-treated steel rack and pinion is used and heat-treated steel gears mesh with the spindles. Lubricant is supplied to the work tools by a gear-driven pump mounted within the base. A one-shot oiling system reaches all bearings and moving parts.

Machine Tool Dealers Discuss Live Subjects

THE Associated Machine Tool Dealers opened their annual meeting, Sept. 26, at the Olympia Fields Country Club, Chicago, 27 companies and 45 individuals registered. This was the largest attendance on record. The opening session was planned for all members of the machine tool trade, regardless of whether or not they were members of the association. The sessions that followed, though planned for the Associated Machine Tool Dealers, were likewise open to all interested.

Matters pertaining to the code were given primary attention. It was pointed out that terms of settlement and terms and conditions of sales are not a part of the dealer's code and, therefore, each dealer may continue his standard practices in these matters provided his practices do not violate the rules of fair competition. It was stressed that the supervisory agency for the machine tool industry has no authority over the dealers' association, and, further, the dealers' agency has no authority in matters pertaining to the machine tool builders. Therefore, dealers do not have to sell under the conditions of sales as filed by the builders.

In so far as the dealers are concerned there has been no ruling on terms and conditions of sales by their supervisory agency and a vote showed that the majority disfavored putting such terms in the code.

On the subject of agency agreements as related to codes of fair competition it was indicated that the dealers want one sales code to cover both dealers and direct sellers. Discussion on discounts and distribution of electric motors disclosed that as yet electrical manufacturers have not fully established a sales policy under their code. The dealers want action so that they will be put on a better footing in respect to direct sellers when machines are involved that are arranged for motor drive.

Standardization Work

The standardization committee is working on a standardized engineering data form and is also considering a standard method of showing serial numbers on machine tools. The executive committee reported the acceptance of one new company member and the receipt of two new applications. Revised by-laws were read and copies will be mailed to the membership for study and revisions. One of the significant suggestions is to change the name of the association to "National Machine Tool Distributors Association." The by-laws as now drafted and suggested are, it is claimed, more in conformity with the requirements of the National Recovery Act.

The new officers are:

President, William F. McCarthy, Henry Prentiss & Co., New York, vice-president, Norton A. Booz, Federal Machinery Sales Co., Chicago; secretary, James R. Van Dyke, Van Dyke, Churchill Co., New York; and, treasurer, Harry Barney, Barney Machinery Co., Pittsburgh.

New directors are:

R. G. English, English & Miller Machinery Co., Detroit; Omar S. Hunt, Marshall & Huschart Machinery Co. of Indiana; and C. C. Brogan, W. E. Shipley Machinery Co., Philadelphia.

Detroit Chapter, A.S.M. To Visit Laboratories

A VISIT to the engineering research laboratories of the University of Michigan is one of the high-lights of the meeting of the Detroit chapter of the American Society for Metals to be held in Ann Arbor, Mich., on Oct. 6. Professor A. E. White of the university will relate the trend in research activities at his institution at the session following the dinner. Attendance at the University of Michigan-Michigan State football game in the afternoon is on the program.

Steel & Tubes, Inc., Cleveland, subsidiary of the Republic Steel Corpn., is establishing distributers of electrically welded mechanical tubing in important manufacturing centers throughout the country. Heretofore, the company had utilized warehouse outlets only for distribution of Electrunite boiler tubes. Warehouse stocks of electrically welded mechanical tubing are now carried by Tubular Service Corpn., New York, Philadelphia and Boston; Service Steel Co., Detroit; Williams & Co., Pittsburgh; Hamilton Steel Co., Cleveland, and Edgar T. Ward's Sons Co., Chicago.

Light-Weight, Streamlined

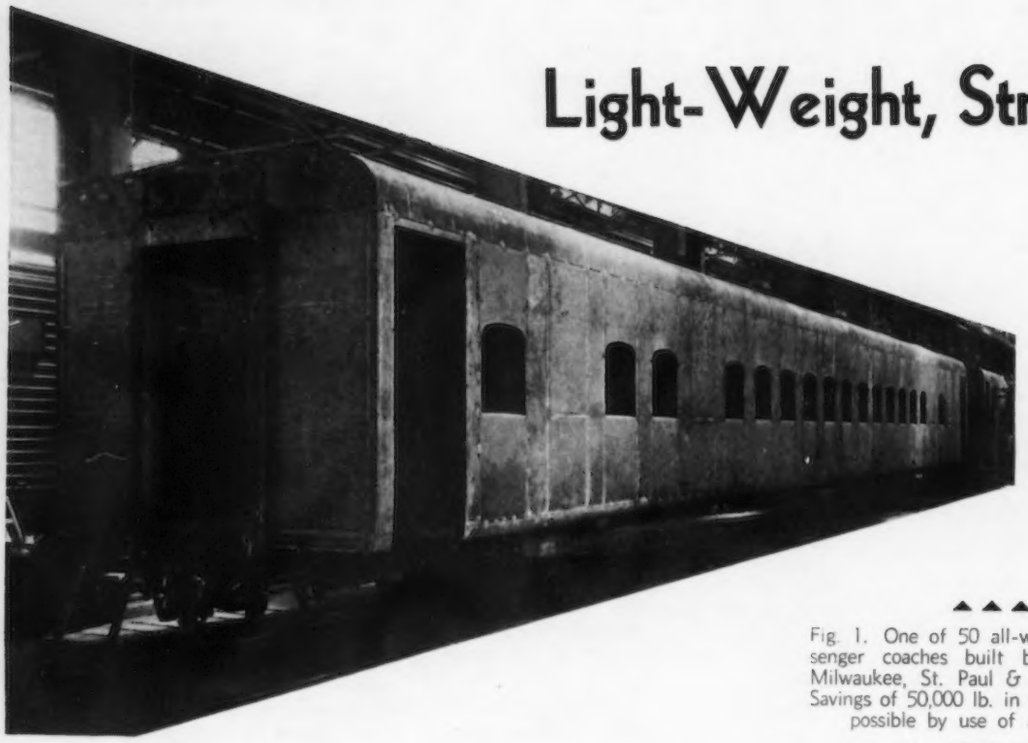


Fig. 1. One of 50 all-welded steel passenger coaches built by the Chicago, Milwaukee, St. Paul & Pacific Railroad. Savings of 50,000 lb. in weight are made possible by use of arc welding.

SAVINGS of 35 per cent in weight are made possible by the use of arc welding in the construction of 52 new streamlined air-conditioned steel passenger coaches which the Chicago, Milwaukee, St. Paul & Pacific Railroad is building in its Milwaukee shops for both day and night service between Chicago and the Pacific Coast. The construction of these coaches, made possible through the use of arc welding, will bring about new economies in train operating costs and will facilitate higher speeds.

Of conventional sizes, the new Milwaukee arc welded steel coaches are 80 ft. 8 in. long over the pulling faces of the couplers, 10 ft. wide, and 13 ft. high above the rails. The total weight of the new coach is approximately 96,000 lb., as compared with 146,000 lb. for previously constructed coaches of the same size.

The new coaches are moderately streamlined and tubular in shape. The roof is of turtle-back form. There are none of the usual projections such as window sills, etc., on the sides of the coaches. Sheets forming the sides are rounded inwardly below the windows to provide smooth passage of air along the sides of the coach.

The entire body of the coaches is built by arc welding. A built-up design consisting of structural shapes, plates and sheets joined by welding is the basis for construction of the underframe, which includes the center sill, bolsters, buffer beams and body end sills.

In welding the pan-like sections of the floor structure of the cars, they are assembled together with flanges upward. The flanges are then spot welded, after which the entire assembly is turned over and welded continuously with the shielded carbon arc process.

A detail of this construction is illustrated in Fig. 2, which shows the underframe in its final position on the car, that is, with the continuous carbon arc automatic welds on the outside bottom or flush side.

The floor pans are of ⅛-in. sheets formed with the flange extending from one side sill to the other. The welds joining this underframe floor structure to the center sills are intermittent.

Steel shapes, sheets and pressings all joined by welding are used in construction of the body and vestibule end frame. The side sills of the cars are 4 in. 8.2-lb. Z-sections extending from one corner post to the other.

The sides of the coaches consist of three different sizes of pans, all

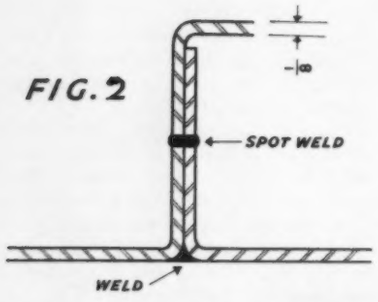


Fig. 2. Typical automatic weld used in fabrication of the underframe of new all-welded steel passenger coaches.

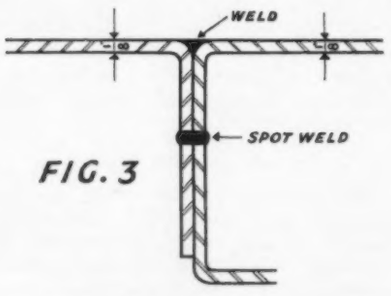


Fig. 3. Typical automatic weld used in joining the pans forming the sides of new Milwaukee passenger coaches.

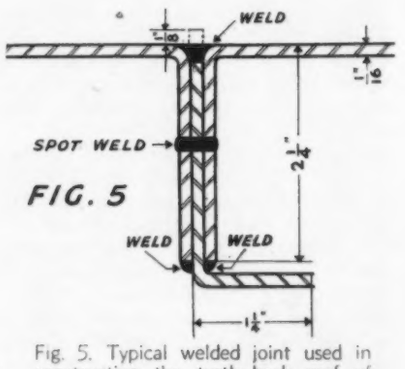


Fig. 5. Typical welded joint used in constructing the turtle-back roof of the new all-welded steel passenger coaches.

Passenger Coaches Are Arc Welded

joined by welding. All side pans are fabricated from ⅛-in. sheets. Structural strength is gained by forming flanges on sheets to give angle and channel effect.

The first size pan used in side construction extends between the windows from the side sill to the side plate. The second size pan extends from each window down to the side sill. The top flange of these pans forms the window sill. The third size pan extends from the top of the window to the side plate. These pans have angle-shaped flanges on all four sides.

Pressings used in the coach side construction are made with open corners (later filled in by welding) and with holes punched in the flanges for bolting them together and lining up the superstructure before welding.

The pans forming a side of a coach are assembled in a jig bolted down, welded automatically, one pan being welded to the other on the smooth out-

(Concluded on Page 67)

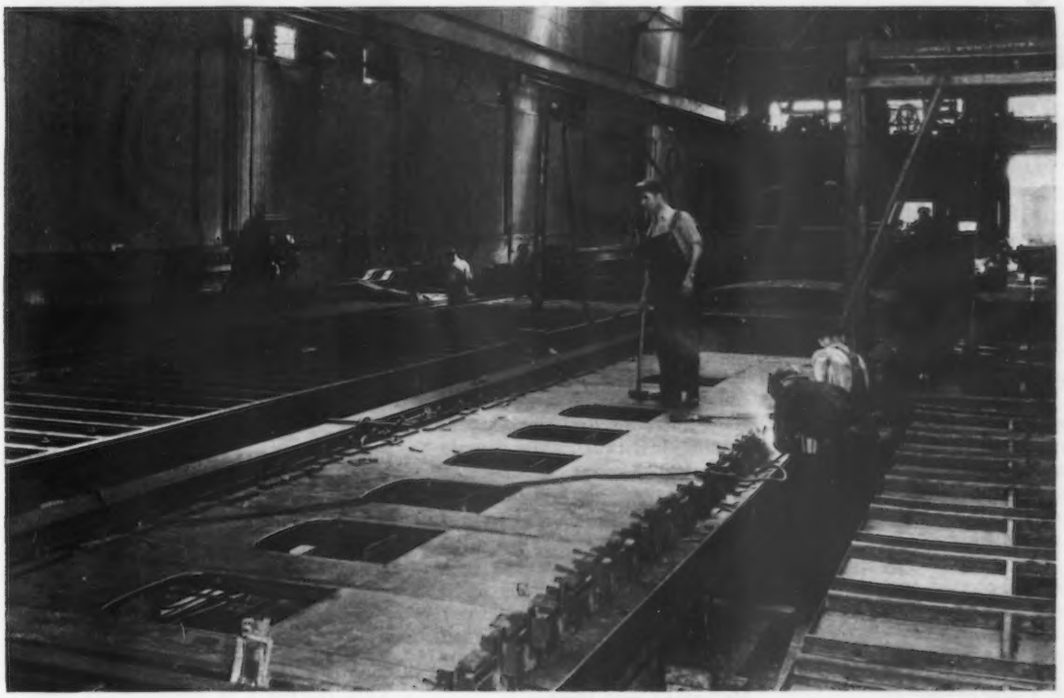


Fig. 4. A welder at work on a side of one of the passenger coaches.

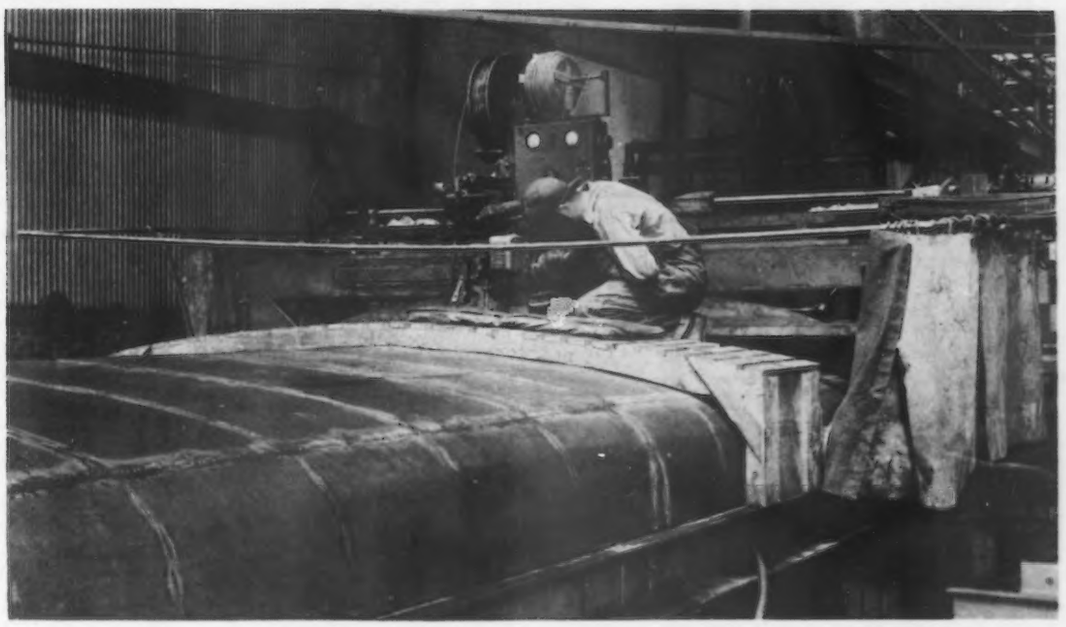


Fig. 6. Using a Lincoln Electronic Tornado automatic welder in assembling the sections in the roof of one of the coaches.

THE NEWS OF THE WEEK

ICC Hearings On Increased Freight Rates Open — Carriers Cite Cost Rises

WASHINGTON, Oct. 2.—With the railroads seeking an increase of $170,000,000 in annual revenue, hearings on the application for an advance in freight rates were begun yesterday before the Interstate Commerce Commission, with Commissioner Clyde B. Aitchison presiding. The application is based on additional expenses to which the carriers have been subjected as the result of higher costs of materials following operation of codes and of wages. On most heavy commodities, including iron and steel, the increase sought is 10 per cent. However, according to the railroads' own figures, the rise in the cost of iron and steel purchased by them was only 6.3 per cent, the smallest increase in the entire list of commodities purchased and presented to the commission. The weighted average increase on all commodities purchased was 20.4 per cent.

Railroads Present Case First

It probably will require the remainder of the week for the railroads to present their case. Shippers will follow to protest against higher rates. Iron and steel interests apparently will not oppose the application except in a few instances.

R. V. Fletcher, general counsel of the Association of Railway Executives, in outlining the position of the railroads, said that increases in railroad expenses amount to almost $300,000,000. He said candidly that the reason the railroads are not asking for more than $170,000,000 is that the traffic officers are not able to say with any assurance that increases in greater amount would be productive of increased revenue "and at the same time be safely within the zone of reasonableness." He declared that the proposition to increase rates comes at a period of steadily rising commodity prices. It is put forward, he said, in all seriousness and not for some fancied and fantastic reasons of policy.

He assured the commission that the "railroads are not trifling with their patrons from any foolish conception of what strategy demands. They are simply asking to be classified with industry generally and to be permitted to advance the price of what they have to sell when costs which they cannot control make such a course imperative." He also presented figures to show that the threatened deficit of $73,000,000 of the railroads for 1934 is not due to operating inefficiency. On the contrary, he stated, testimony will show that in the decade ended with 1933 speed of freight trains between terminals has been increased 50 per cent; the average tractive power of locomotives has been increased 26 per cent; the average cost of handling freight traffic per 1000 ton-miles has been reduced 40 per cent, the average efficiency of coal used as fuel has been increased 25 per cent.

Material Costs Higher

Referring to increase in material costs following operation of NRA, Mr. Fletcher said testimony will show that when comparing 1933 with 1934, the cost of fuel coal has increased 29.5 per cent; fuel oil, 32.8 per cent; cross ties, 23.6 per cent; timber and lumber, 54.2 per cent; iron and steel, 6.3 per cent, and miscellaneous items, 14.1 per cent. The wage increase, he stated, was the outcome of a controversy in the solution of which the President of the United States and the Federal Coordinator of Transportation participated. It assumed, therefore, the aspect of Governmental activity.

Mr. Fletcher was referring to restorations made to wage deductions, which started July 1, 1934, and are to be completed April 1, 1935. They will aggregate $156,000,000. Dr. Julius H. Parmelee, director of the Bureau of Railway Economics, in pointing out increased costs, also stated that a further increase arises from the operation of the Railroad Retirement Act, which became effective on Aug. 1, and the constitutionality of which is now being questioned in the courts. The increased cost of materials was placed at $134,000,000.

Railroad witnesses said that while the operating income in the first four months of 1934 showed improvement over the corresponding period of 1933, there was a decline of almost $2,000,000 in May, a further decline of $18,000,000 in June, and a still further decline of $30,000,000 in July below the earnings of last year. Preliminary reports indicate, they said, that the net operating income of Class I railroad in August this year will be substantially below the corresponding month in 1933.

Fabricated Steel Awards Higher in August

ACCORDING to final returns received by the American Institute of Steel Construction, August bookings of fabricated structural steel recorded a 28 per cent recovery from the July low point of the summer. This estimate is based upon reports received from 82 per cent of the industry, indicating August bookings 14 per cent ahead of the monthly average of the last quarter of 1933, 4 per cent larger than the average monthly bookings of the first quarter of 1934, but 13 per cent less than the monthly average bookings of the second quarter of this year and 5 per cent less than the bookings of August, 1933.

August shipments continued at an increased rate, being about 70 per cent larger than the average monthly shipments during the first half of 1934. As a result the backlog of the industry is disappearing, the tonnage ahead now being approximately 3 per cent less than it was at this time last year.

The American Car & Foundry Co., New York, has placed an order with the Timken Roller Bearing Co., Canton, Ohio, for bearings and boxes for an eight-car, high-speed, streamlined steam train which it is building for the Baltimore & Ohio Railroad at St. Charles, Ill., shops.

Non-Ferrous Foundry Industry Adopts Code of Ethics and Cost System

COST estimating and accounting, trade customs, terms of payment, classifications of castings and problems relating to the code all came in for thorough discussion at the national convention of the Non-Ferrous Foundry Industry, held at the Bismarck Hotel, Chicago, Sept. 19 to 21. Present officers were reelected. These are N. K. B. Patch, Lumen Bearing Co., Buffalo, president; A. B. Norton, Aluminum Co. of America, Cleveland, vice-president; and Sam Tour, Lucius Pitkin, Inc., New York City, executive secretary and treasurer.

Pricing, its relation to code rules and ways and means of aiding individual members in the industry to understand the rules and thereby avoid penalties, formed the thread of most discussions. It was pointed out that the principle of flat price quoting is based upon the belief on the part of many that what they lose on small or intricate work they make up on large or simple work, and that on the average they hope or think they break even or make a profit.

To quote a flat price per pound for a variety of castings of widely varying weight and/or intricacy is prohibited by the Supplemental Codes covering the Miscellaneous Sand Castings division, the Steel and Rolling Mill Castings Division, and the Aluminum Permanent Mold Division of the Non-Ferrous Foundry Industry. This prohibition against flat price quoting is in effect and has been in effect since Dec. 25, 1933. Any violation of it is subject to the penalties referred to in the National Industrial Recovery Act.

This prohibition against flat price quoting must be considered from the standpoint of the prohibition against selling below cost. The Supplemental Codes referred to above prohibit the sale of any castings below cost. It is obvious that in quoting a flat price for a wide variety of castings, quotations are below cost on certain of those castings, and, therefore, are in violation of the below cost selling provision of the code.

Some attempt has been made to evade the spirit of the code by quoting only a fraction of a cent differential between castings of widely varying weight and/or intricacy in order not to be quoting a flat price. This is a direct evasion of the spirit of the code and it will be necessary in many cases for people quoting in this fashion to prove by actual cost records and production records in their plants that they are able to produce these small or intricate castings at the prices quoted.

The convention went on record recommending that the code authority present to Washington a cost accounting and estimating system which was adopted at the Wednesday meeting. This system is to be used for estimating purposes and its use is not compulsory, but, as stated in the meeting, every foundry must have on file records to prove it is not selling below cost and this system provides that means if a satisfactory system is not already in use. It also tends to establish a system that is uniform.

Average departmental costs for each plant over a period of the preceding six months or one year, as developed by this system either in its simplest form or more detailed, shall be used by each plant for estimating costs in order that quotations shall not be below costs. In case any one fails to, does not desire to or cannot establish these average departmental costs for his own plant, then he shall be governed by the average departmental costs so established in from three to five plants in his district doing a similar class of work. The number of plants, the selection of the plants and the determination of the averages will be under the executive committee of the nearest local chapter. All findings will be subject to the approval of the code authority.

Whenever a material change occurs in wage rates, material or supply prices or overhead expenses new averages of departmental costs should be figured and from then on these new departmental costs will be used in estimating. All labor shall be estimated on the basis of paying wage rates at least equal to the average wage rates being paid in the territory for the class of work performed.

Where some of the departments shown are not operated in the plant in question they need not be incorporated in the figures.

The following are considered as profit and loss items and are not figured as part of costs but come out of apparent profits before any real profit is realized on business done: interest on investment, interest on debt, dividends on stock or bonds, research and development expense, bad accounts, declines in market value of inventory and special sales or advertising campaigns.

How Fixed Overhead Is Computed

The least portion of fixed overhead which must be absorbed is that percentage of the total fixed overhead that the volume of business in pounds of good castings produced during the preceding three calendar months bears to the "normal" volume of business in pounds for the particular plant. The "normal" volume of business in pounds for any plant is considered as 60 per cent of that plant's best six consecutive months production since Jan. 1, 1924 (ten years). If, however, capacity has been added by such plant since the period of the best six consecutive months' production after Jan. 1, 1924, then the "normal" volume of production shall be increased by the ratio of increase in plant facilities. Such ratio of increase shall be determined by the percentage of increase in plant investment. Likewise if any facilities in use during the period of the best six consecutive months after Jan. 1, 1924, have been sold or otherwise disposed of, then the "normal" volume of production shall be decreased by the ratio of decrease in plant investment.

Having determined the percentage as above, then that percentage of fixed overhead must be absorbed in the various departments.

It was decided that shrinkage allowance on copper-base metals should remain at 5 per cent but that on aluminum the figure be dropped to 3 per cent. An item "cores per casting" is to be added to the estimate sheet.

Standard Trade Customs Defined

The next step taken by the convention was to adopt a code of ethics or standard trade customs which are to be incorporated on a uniform proposal sheet. The question of terms of payment brought forth loud discussion, with the final removal of the item from the trade custom list and its submission to the Miscellaneous Sand Casting Supplemental Code Committee in order that terms of payment can be enforced by the code authority.

Standard trade customs of the industry are defined as follows:

Inquiries from purchasers shall give actual or estimated rough weights of the castings.

Inquiries from purchasers shall give a

AFTER ALL, WHY WORK?

THE J. L. Osgood Machinery & Tool Co., Inc., Buffalo, recently had occasion to order a quantity of bass wood from a New York State lumberman. The order was not filled and the following apologetic letter was received:

Colden, N. Y., Sept. 12, 1934

J. L. Osgood,
Buffalo, N. Y.

Dear Sir:

I shall not be able to supply you with bass wood as I cannot get help to do the work. It would have to be cut, hauled to mill and sawed into lumber, then stacked to season or dry out, and then ripped into squares. I don't feel that I can do the work as I am past 76 years old and have a farm to work. All the young, able-bodied men around here are on welfare and will not work.

Yours truly,
George Koerner.

detailed description of pattern and core box equipment to be furnished. This description should indicate whether the pattern and core box is plated, gated, single, skeleton or sweep, metal or wood. Before patterns are made, the purchaser shall submit blueprints to the member of the industry that is to make the casting, to obtain suggestions concerning the best method for constructing the pattern equipment.

When the purchaser furnishes pattern equipment, skeleton patterns, core boxes, sweeps or conjunction pattern contrary to the description already given, and which increase the cost of production, an extra charge shall be made to cover the increase in cost.

Members of the industry are not responsible for variations existing between blueprints and equipment supplied by the purchaser. Any expense due to incorrectness of pattern and core box equipment shall be borne by the purchaser.

Patterns, core boxes, loose pieces thereof, core driers, core plates, etc., shall be properly marked for identification. Purchaser shall mark equipment for identification.

All transportation charges, by reason of using a common carrier, on pattern equipment to and from the plant of a member of the industry shall be paid by the purchaser.

All packing and crating cost in excess of one dollar for transportation of patterns by reason of using a common carrier to and from the plant of a member of the industry shall be paid by the purchaser.

Insurance on patterns against fire and the elements shall be the responsibility of the purchaser.

Members of the industry shall be responsible for lose or damage to pattern equipment only when due to careless handling or negligence on the part of such members of the industry, but not when due to fire or other causes beyond their control.

Changes in order shall be confirmed in writing by the purchaser.

No order should be changed unless notice of revision is made and accepted in writing before work is in process. If work is in process, purchaser shall be charged for any castings made as well as cost of cores, molds or equipment discarded because of such changes.

A member of the industry is responsible only to the extent of replacing castings rejected due to foundry defects, and such castings must be reported or returned to the maker within a reasonable time after shipment. Castings to replace rejected castings shall be shipped free of cost to the purchaser.

The member of the industry is not responsible for labor charges, loss or damage caused by defective castings.

A member of the industry shall not be liable for consequential, special or contingent damages.

Any labor charges incurred in the salvaging of defective castings, shall be mutually agreed upon in writing between purchaser and member of industry.

Full weight of castings rejected and/or replaced should be returned to member of industry. Crating and transportation charges to be paid by member of industry. Shortages in such weights should be charged for at the current metal prices prevailing on date of order.

Unless otherwise specified, castings are sold as unmachined castings with gates, heads, risers, fins and other projections removed to approximately the contour of the pattern.

Where overtime or Sunday work is required an extra rate is paid and castings made during such overtime period shall carry a proportionate advance in price.

Pattern storage facilities are provided by members of the industry for active patterns only. Patterns not in use for a reasonable period shall be returned to the owner, or be subject to storage charges.

Purchaser agrees to save member of industry harmless from loss or damage by reason of the manufacture and sale of any patented device, or parts thereof made in accordance with drawings, designs, models or patterns furnished by the purchaser.

Member of the industry will not be liable for any delay in the performance of orders or contracts or in the delivery or shipment of goods or for any damages suffered by purchaser by reason of such delay, when such delay, is directly or indirectly, caused by or in any manner arises from fires, floods, accidents, riots, war, Governmental interference or embargoes, strikes, shortage of labor, fuel, materials or supplies, inadequate transportation facilities or any other cause or causes (whether or not similar in nature to any of those hereinbefore specified) beyond its control.

Federal, State or municipal taxes now or hereafter imposed in respect to all sales and/or the production, treatment, manufacture, sale, delivery, transportation or proceeds of the products specified against such sales (except income taxes) will be for account of purchaser, and if paid or required to be paid by member of industry the amount thereof will be added to and become a part of the price payable by purchaser.

Attempts to adopt classifications of non-ferrous castings as to intricacy and as to weight were unsuccessful and the matter was referred back to the classification committee for further study.

British and Continental Iron and Steel Are Quieter

LONDON, ENGLAND, Oct. 2 (*By Cable*).—British pig iron is quieter this week but good inquiries encourage a hope for an early revival. Hematite demand is being affected by higher prices which encouraged consumer stocking at the start but in spite of some cessation in customer activity, large consumption prevails and disposal of the output is assured for many months.

Foreign semi-finished steel is selling badly and the demand for British steel is also quieter with makers needing additional orders. Exports, however, are still expanding, Canada, as well as Australia, after a long interval are again "buying British" and large orders are being booked for South Africa, China and Russia.

Tin plate is quiet and output may be curtailed, although the current fair volume of inquiries may result in business when consumers become reconciled to the agreement. Some export business is being done in this commodity.

Continental iron and steel business is fairly satisfactory, particularly for semi-finished steel and bars. Sheets are quiet in this market.

Quotations for the Japanese market have been temporarily suspended pending a revision of prices, in view of strong demand. Freight rates in the Near East have been advanced one shilling (paper).

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9
Billets, open-hrth.	£5 10s. to £5 15s.
Tin plate, per base box	18s. 2d.
Steel bars, open-hearth	£7 17½s.
Beams, open-hrth.	£7 7½s.
Channels, open-hearth	£7 12½s.
Angles, open-hearth	£7 7½s.
Black sheets, No. 24 gage	£9 5s.
Galvanized sheets, No. 24 gage	£11 5s.

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas	£2 7s.
Wire rods, No. 5 B.W.G.	£4 10s.
Steel bars, merchant	£3 5s.
Sheet bars	£2 8s.
Plates, ¼ in. and up	£4
Plates, 3/16 in. and 5 mm	£4 2s. 6d.
Sheets, ⅛ in.	£4 7s. 6d.
Beams, Thomas	£3 2s. 6d.
Angles (Basic)	£3 2s. 6d.
Hoops and strip base	£4 2s. 6d.
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4-pt. No. 10 B.W.G.	£8 15s.

Stewart-Warner Sales Up 75 Per Cent

SALES by the Stewart-Warner Corpn., Chicago, and subsidiaries continue above those for last year, according to Joseph E. Otis, Jr. A seasonal recession was noted in July but there was marked improvement in August which has continued during the month of September. Sales by the parent company for the year to date are fully 75 per cent above a year ago.

Steel Imports Shrink But Exports Doubled Last August

Exports of Iron and Steel from the United States

(In Gross Tons)

	August		Eight Months Ended August	
	1934	1933	1934	1933
Pig iron	285	412	2,238	1,703
Ferromanganese	26	3	44	11
Scrap	155,542	70,145	1,050,202	464,117
Pig iron, ferroalloys and scrap	*155,853*	*70,560*	*1,052,484*	*465,831*
Ingots, blooms, billets, sheet bars	65	699	8,781	1,603
Skelp	8,770	1,184	59,220	9,414
Wire rods	1,414	1,268	17,788	8,532
Semi-finished steel	*10,249*	*3,151*	*85,789*	*19,549*
Steel bars	2,676	2,493	26,874	13,239
Alloy steel bars	116	135	1,961	874
Iron bars	115	47	716	347
Plates, iron and steel	3,776	961	25,150	4,742
Sheets, galvanized steel	6,398	3,091	42,715	21,017
Sheets, galvanized iron	103	78	989	623
Sheets, black steel	8,568	2,945	58,929	17,629
Sheets, black iron	527	354	3,252	1,331
Hoops, bands, strip steel	1,840	1,939	21,004	13,254
Tin plate, terne plate	11,227	7,333	122,324	37,682
Structural shapes, plain material	3,251	2,594	20,203	7,573
Structural material, fabricated	1,836	1,241	11,970	8,752
Tanks, steel	394	154	4,550	1,546
Steel rails	6,248	2,951	53,231	11,229
Rail fastenings, switches, spikes, etc.	1,233	1,180	12,826	2,873
Boiler tubes	1,080	353	4,869	2,468
Casing and oil line pipe	8,291	1,441	47,758	18,202
Pipe, black and galvanized, welded steel	3,723	3,846	29,787	19,144
Pipe, black and galvanized, welded iron	350	108	1,670	934
Plain wire	3,532	3,320	25,440	9,436
Barbed wire and woven wire fencing	3,752	3,807	26,120	17,286
Wire cloth and screening	133	71	615	444
Wire rope	158	181	1,845	1,215
Wire nails	996	1,442	9,378	6,270
Other nails and tacks	487	451	3,528	2,570
Horseshoes	21	47	88	104
Bolts, nuts, rivets and washers, except track	463	240	3,330	2,001
Other finished steel	485	401	4,409	2,441
Rolled and finished steel	*71,779*	*43,204*	*565,531*	*225,226*
Cast iron pipe and fittings	2,269	1,081	10,376	6,402
Malleable iron screwed fittings	322	229	2,048	1,371
Carwheels and axles	1,292	392	3,630	2,725
Iron castings	591	495	5,217	1,823
Steel castings	173	91	1,406	581
Forgings	419	171	2,826	1,896
Castings and forgings	*5,066*	*2,459*	*25,503*	*14,798*
Total	242,947	119,374	1,729,307	645,404

Imports of Iron and Steel Products into the United States

(In Gross Tons)

	August		Eight Months Ended August	
	1934	1933	1934	1933
Pig iron	18,418	18,488	86,801	99,620
Sponge iron	1	100	744	372
Ferromanganese and spiegeleisen*	1,818	4,889	21,426	31,367
Ferrochrome†	2	....	67	21
Ferrosilicon‡	20	28	597	110
Other ferroalloys§	....	....	46	102
Scrap	1,025	9,508	29,160	32,417
Pig iron, ferroalloys and scrap	*21,284*	*33,013*	*138,841*	*164,009*
Steel ingots, blooms, etc.	290	121	988	492
Wire rods	720	1,174	8,243	8,992
Semi-finished steel	*1,010*	*1,295*	*9,231*	*9,484*
Concrete reinforcement bars	142	99	960	1,806
Hollow steel bars	....	54	512	574
Merchant steel bars	1,675	1,518	12,752	11,999
Iron slabs	....	....	1	1
Iron bars	111	53	620	296
Boiler and other plate	54	35	182	157
Sheets, skelp, and saw plate	576	861	3,139	6,742
Tin plate	11	9	117	211
Structural shapes	2,480	2,894	14,400	18,000
Rails and rail fastenings	225	1,184	2,105	4,581
Welded pipe	39	369	1,216	2,519
Other pipe	285	176	2,156	1,022
Barbed wire	830	347	7,336	5,782
Round iron and steel wire	187	378	1,860	2,064
Flat wire and strip steel	245	168	1,080	689
Wire rope and strand	170	179	1,043	1,061
Other wire	71	189	588	1,193
Hoops and bands	2,323	3,303	11,769	13,562
Nails, tacks, and staples	428	379	5,129	4,086
Bolts, nuts, and rivets	19	18	186	179
Other finished steel	29	45	1,408	372
Rolled and finished steel	*9,900*	*12,258*	*68,559*	*76,896*
Cast iron pipe and fittings	29	148	40	724
Castings and forgings	195	125	1,061	791
Total	32,418	46,839	217,732	251,904

*Manganese content only.
†Chromium content only.
‡Silicon content only.
§Alloy content only.

TOTAL exports of iron and steel from the United States during the month of August, 1934, aggregated 242,947 gross tons. This was practically double the total for the same month a year ago.

Scrap comprised well over half of the total, and Japan, as usual, took the lion's share of this commodity, receiving 109,048 gross tons of a total of 155,542 tons. Italy followed with 21,068 tons.

Tin plate exports increased to 11,227 tons, Japan, China and Argentina being the leading recipients in the order named. Canada, Russia and Mexico were our leading customers for black plates.

Imports of iron and steel into the United States were almost 50 per cent less in August than a year ago. The total amounted to 32,418 gross tons as compared with 46,839 in August of last year. Of 18,418 gross tons of pig iron imported, Netherlands furnished 11,751; India following with 5135 tons.

Cuba and the Gold Coast furnished us with nearly equal amounts of manganese concentrates, together supplying some 1300 tons out of a total of 18,166.

Detailed figured are given in the accompanying tables.

United States Imports of Pig Iron by Countries of Origin

(In Gross Tons)

	August		Eight Months Ended August	
	1934	1933	1934	1933
United Kingdom	50	....	250	5,140
British India	5,135	8,260	25,215	40,959
Germany	....	....	....	234
Netherlands	11,751	6,176	52,953	42,983
Canada	....	3,413	4,664	4,419
France	....	....	....	....
Belgium	....	....	50	....
Norway	1,084	....	2,046	602
Sweden	300	177	565	2,980
All others	98	462	1,058	2,237
Total	18,418	18,488	86,801	99,554

Washing Machine Shipments in August

HOUSEHOLD washing machine shipments in August amounted to 111,808 units. This is the largest August in the industry's history with the exception of last summer's runaway market, according to figures reported by the secretary of the American Washing Machine Manufacturers' Association.

The Metal Package Corpn., subsidiary of McKeesport Tin Plate Co., McKeesport, Pa., has acquired the National Can Co., Boston, manufacturer of tin cans for commercial and industrial purposes.

Kohler Workers' Union Registers Big Majority

BY a vote of 1063 to 643, the Kohler Workers' Association, so-called company union, won the election held Sept. 27 to determine if the association or Federal Union No. 18,545 is to represent all Kohler employees as collective bargaining agents with the Kohler Co., Kohler, Wis. This vote however, did not include 577 ballots which were challenged or protested by representatives of either side of the controversy, or five ballots which were declared void. The protested or challenged ballots were sealed in envelopes by the voters, and their status in the election will be determined later. However, the issue was sufficiently decisive in favor of the Workers' Association that the protested votes will not affect the ultimate result of the election.

Walter J. Kohler, president of Kohler Co., issued the following statement after the announcement of the result of the election:

"The results of the election show clearly that the overwhelming majority of employees prefer to be represented by the Kohler Workers' Association rather than by the American Federation of Labor Union.

"Of the votes that were not challenged, 1063 were cast for the Kohler Workers' Association and 643 for the union. The union challenged 368 votes which it is fair to assume were cast for the Kohler Workers' Association, and the association protested 207 votes which probably were cast for the union. The total vote, therefore, was approximately 1431 for the Kohler Workers' Association and 850 for the union.

N.L.R.B. to Make Final Ruling

"What the final tabulation will be, of course, is up to the National Labor Relations Board which is to rule whether or not the office employees are to be counted and to pass upon the right to vote of those challenged for violence in connection with the strike and for other causes. However, whatever disposition the board makes of the contested votes, the Kohler Workers' Association has won the election and the fact remains that the employees as a whole, in a secret ballot conducted by the Government, have definitely repudiated the strikers."

Carl Sass, acting president of the Kohler Workers' Association, issued the following statement:

"Any way you figure it, it is a great victory for the Kohler Workers' Association and a stinging rebuke to violence and radicalism.

"How can anybody say now that the K.W.A. is dominated by the company in view of the big majority of K. W. A. votes in this secret ballot election conducted by the United States Government?

"The K. W. A. stands on its own feet as the organization representative of the overwhelming majority of Kohler workers."

The executive committee of Federal Labor Union No. 18,545 issued the following statement:

Federal Union Makes Complaint

"The union will continue the present status of picketing and does not in the least feel that its cause is lost. In checking the totals of the votes the union feels that the fact that the Kohler Co. had a pay roll in its possession put the union to an unfair disadvantage and caused the present results in the vote."

Acklin Company Adopts Retirement Plan

THE Acklin Stamping Co., Toledo, Ohio, has adopted an employee retirement program which will enable its workers to retire at certain fixed ages with pensions guaranteed for life.

Participation in the plan is open to all present and new employees when one year of continuous service has been completed. Contributions to establish the retirement fund, which is being administered by the Metropolitan Life Insurance Co., will be made jointly by employer and employees. The normal retirement age has been fixed at 65 for men and 60 for women. With the consent of the employer, however, retirement may be earlier if the employee agrees to accept a reduced pension.

Aluminum Co. Acquires Aluminum Colors, Inc.

ALUMINUM CO. of America has acquired all of the patents and properties of Aluminum Colors, Inc., of Indianapolis, Ind. Plans have been made for the transfer of equipment from the Indianapolis works to the New Kensington works of the Aluminum Co.

During a period of four years, the business of Aluminum Colors, Inc., has grown from the stage of patent applications to a point where the Aluminite process is applied annually to a substantial tonnage of aluminum. Examples of this tonnage are: Aluminum refrigerator trays, all of which receive this protective treatment; the Alumilited pistons for automobile engines, a new development which the industry regards as a distinct step forward in automotive progress; and the widespread use of Alumilited products in the many architectural applications of aluminum. This last field necessitated the development of special equipment at the Indianapolis plant for the treatment of architectural shapes.

Michigan Not to Compete in Relief

THE State Relief Commission for Michigan has given assurance to the Michigan Manufacturers' Association that it does not intend to compete with private industry in its welfare program the coming winter. Fears previously had been aroused because the Commission had entered into canning, mattress manufacturing and other business fields. A statement issued by the State Commission says, in part,

"Recently the State Administration has been receiving a considerable quantity of surplus commodities distributed by the Federal Surplus Relief Corpn. In the processing of these commodities the commission's policy has been to operate closed plants with relief labor for the production of goods to be consumed exclusively by persons on the relief rolls. Under no conditions are the products produced placed for sale in the open market. These products do not as a rule displace purchases heretofore made from private business. For the most part they would not be available unless produced with materials made available to us and by labor already on the relief lists."

The commission points out that it has encouraged the policy of aiding distressed factories by directing to them the purchases of bulk commodities required by the various county relief administrators. As a result, declares the commission, "it has been possible for several such plants to resume their normal operations." The great bulk of commodities and services required by the more than 750,000 persons on relief in Michigan are provided through the ordinary channels of trade.

American Smelting Doubles Net Profit

AMERICAN SMELTING & REFINING CO. and subsidiaries earned net profit of $4,263,577 during the first half of 1934. This is after all charges including income and corporate takes. It compares with $2,030,209 earned during the corresponding period of 1933.

PERSONALS

WALTER S. DOXSEY has been appointed executive secretary of the American Steel Warehouse Association, effective Oct. 1, as a step in the reorganization and expansion of the association in order to increase its services in behalf of the steel warehouse as the channel of distribution for finished steel products. The association has moved its headquarters from Philadelphia to 442 Terminal Tower, Cleveland. H. B. RESSLER is president of the association and vice-president in charge of Eastern operations of Joseph T. Ryerson & Sons, Inc. Mr. Doxsey is well known in the iron and steel warehouse industry. For the past eight years he has been editor of the *Daily Metal Trade*, Cleveland, and prior to that time was assistant sales manager of the McMyler Interstate Co., Cleveland.

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GEORGE T. CHRISTOPHER has been named assistant vice-president of manufacturing of the Packard Motor Car Co., Detroit, and will have charge of production of the new light car to be made by the Packard company. A graduate of Rose Polytechnic Institute, he took his apprenticeship training with Westinghouse Electric & Mfg. Co. For the last 17 years he has been associated with General Motors Corpn., serving at various times as chief inspector of the Delco Appliance Corpn., chief inspector of the Olds Motor Works, factory manager of the Pontiac Motor Co. and works manager of the Buick Motor Co.

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J. A. VOSS, director of Industrial Relations, Republic Steel Corpn., Youngstown, was chosen general chairman of the Metals Section of the National Safety Council at a meeting of the section held Oct. 1 in connection with the Twenty-third Annual Safety Congress and Exposition being held this week in Cleveland. Mr. Voss has long been associated with safety work and the activities of the Metals Section. He formerly was safety director of the Inland Steel Co., later holding a similar position with the Central Alloy Steel Corpn., and became safety director of the Republic Steel Corpn. when that corporation was formed. In 1933 he was appointed director of industrial relations. A dinner was given Mr. Voss in Cleveland Monday evening which was attended by a number of the officials of the Republic Steel Corpn.

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THOMAS C. POTTS, who has been associated with Horace T. Potts Co. and its predecessor, Horace T. Potts & Co., Philadelphia, since 1890, has been elected president of the company, succeeding HARRISON I. POTTS.

WILBUR H. WINTERS, heretofore general superintendent of foundries of the American Brake Shoe & Foundry Co., New York, has been elected vice-president in charge of operations of the company. He entered the employ of the company in 1916, after having been engaged for five years on fortification construction work on the Panama Canal. In 1921, Mr. Winters was appointed assistant comptroller and in 1924 was transferred to the operating department as general superintendent of foundries. He has been active in the preparation of the gray iron foundry code and is a member of that code authority.

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W. A. NUGENT, who has served the Independent Pneumatic Tool Co. in various executive capacities for the past 20 years, has been made vice-president in charge of sales. NEIL C. HURLEY, JR., who has been in charge of distribution of the company's electric tools, has been elected secretary.

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ROBERT W. BALLENTINE, for 16 years identified with the Timken Roller Bearing Co., has been appointed Milwaukee district manager for the Tyson Roller Bearing Corpn., Massillon, Ohio. HYMAN LEDEEN, formerly with the Falk Corpn., has been made district manager for the Tyson company with headquarters in San Francisco and Los Angeles, to cover the Southwest. BEN L. CREW, JR., sales engineer, has been assigned to the Detroit office, and E. L. FARNSWORTH has been appointed service sales representative with offices in New York.

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CARL W. MEYERS, roll engineer, Republic Steel Corpn., has been made assistant manager of the Canton and Massillon, Ohio, district, with headquarters at Canton. Prior to his association with Republic Steel Corpn., he had been superintendent of the Carnegie Steel Co.'s McDonald works.

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FREDERICK B. HEITKAMP, who has been identified in an executive capacity with Lyon Metal Products, Inc., Aurora, Ill., since July 1, has been appointed general sales manager of the company. In his new position Mr. Heitkamp will have supervision of all sales activity, including advertising and sales promotion. He was formerly general sales manager of the Cincinnati Milling Machine Co.

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R. X. RAYMOND, heretofore identified with the Chicago office of the Chain Belt Co., Milwaukee, has been appointed manager of the Minneapolis district office, succeeding F. A. GUNTHER, who has been transferred to become district manager of the Detroit territory.

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D. M. WILHELM, sales manager of the Patterson Foundry & Machine Co., East Liverpool, Ohio, for the past four years, has been elected secretary of the company and has been succeeded as sales manager by E. M. UNDERWOOD, formerly division sales manager at East Liverpool.

OBITUARY

HOWARD K. MOORE, special agent for the Wheeling Steel Corpn., Wheeling, W. Va., and vice-president of the corporation's subsidiaries in Texas and Tennessee, died at his home at Wheeling on Sept. 20, after a three months' illness. He had been identified with the Wheeling Steel Corpn. and predecessor companies since 1910. In that year he was located at Portsmouth, Ohio, with the Portsmouth Steel Co.; later with the Whitaker-Glessner Co., and subsequently with the Wheeling Steel Corpn. at Steubenville, Ohio, finally moving to the company's general offices at Wheeling. His early experience was gained with the Lackawanna Steel Co., Buffalo, N. Y. Mr. Moore was born at Coatesville, Pa., on June 27, 1884.

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EDWARD J. KOLAR, Michigan sales representative of the National Enameling & Stamping Co., died in Harper Hospital, Detroit, on Sept. 19. He was 51 years of age.

P. M. BOYD, formerly secretary-treasurer of the Lorain Steel Co., died at his home in Washington, Pa., on Sept. 14, aged 76 years. He came to the United States from Scotland in 1888 and became identified with Carnegie, Phipps & Co. He later entered the employ of the Johnson Steel Street Rail Co. and remained with that company and its successor, the Lorain Steel Co., until his retirement in 1929.

Railroad Equipment

Chicago & North Western has applied to PWA for a loan of over $5,000,000 for maintenance and equipment repairs.

Chicago & Illinois Midland contemplates buying two 0-8-0 type locomotives.

National Railways of Colombia has ordered one oil-burning locomotive of 2-8-8-2 type from Baldwin Locomotive Works.

United States Department of Interior, Bureau of Reclamation at Denver, has ordered two flat cars from American Car & Foundry Co.

Delaware River Bridge Joint Commission will buy track material for Delaware River bridge and subway, Philadelphia, including 5.36 miles of single track 100-lb. rails and 13,200 ft. of 100-lb. guard rails.

Kohler Versus the Unions

By KENNETH STILLMAN

AN excellent illustration of the injustice and unreasonableness of the wave of strikes that is now sweeping the country is provided in a study of the facts about the controversy at the Kohler Co.'s plant at Kohler, Wis.

A citation of facts concerning this strike which are acknowledged by the mediators sitting in the case, are not denied by the union leaders and are generally known to be true by every one at all familiar with the company and its management, demonstrates clearly and concisely the fundamental reason underlying the unprecedented labor disturbances which threaten the nation.

Frankly, there can be no doubt that this destructive movement is not impelled by the kind motives alleged by the leaders of the movement, to improve the conditions of workers, but is very largely based upon the wholly selfish desires of labor leaders to increase their power and prestige to the point where they can exercise autocratic control over American industry not dissimilar to that gained in somewhat similar fashion by Messrs. Hitler and Mussolini. In the words of a long-time friend of the workers, "Let us look at the record."

Examining the Record

For many years the Kohler Co. has been looked upon by social-minded business men as one of the foremost examples of good employer-employee relations. The president of the company, who was once a Governor of Wisconsin, has always believed in the economic and social advantages, in the operation of a business, of continued fair, trustworthy and friendly relationship between workers, management, customers, owners and the general public. As a result of constant adherence to this belief, workers at the Kohler plant have developed more employee activities, with the management's cooperation, than can be found in any other plant of its size anywhere. If there is something they do not have it is only because the employees do not want it.

Typical of what has been done, 20 years ago the company built houses for its employees—so good that Kohler became known as the model village—and offered these houses for sale on such reasonable terms that more than 90 per cent of the employees eventually owned their own homes. A mutual benefit association provided liberal protection for all employees against death, sickness and accident liabilities; old workers were retired on pensions and scores of other activities of benefit to the employees have long been regular parts of the Kohler program.

Nor did the conditions change during the depression until forced by necessity. Until February, 1931, not an employee was laid off or an hour cut from the normal working week. Not until a year later was any reduction made in wage rates. To enable the company to do this it had been producing its bath tubs, sinks and other plumbing supplies far in excess of what it could sell. How full its warehouses are with surplus goods is indicated by the fact that the construction of residences, which provides the company's largest market, was, during the depression, only 10 per cent of what it had been in 1928, and sales of the plumbing supply industry for the first six months of this year were 34 per cent less than in 1933.

On July 29, 1933, the plumbing fixtures industry submitted a code to the Government which was not approved until January, 1934, but on Aug. 1, 1933, the labor provisions of the code became effective at the Kohler Co. Since that time minimum wages have been 40c. an hr., the same as they were in 1929, and the maximum working week 40 hr. Only 5 per cent of Kohler employees receive minimum wages; all others receive differentials almost as high as prevailed in 1929.

During the late summer of 1933, Federal Labor Union No. 18,545 was organized by the American Federation of Labor in the Kohler plant. The company did not interfere with the organizing work and responded to three requests by the union officials for meetings during the year. Only one meeting with the management was requested by the union this year. On July 6 it presented a list of 14 points, the first of which demanded that "the principle of collective bargaining for working conditions and wages be fully recognized by the company." Five days later the company replied in writing that it had always recognized the right of its employees to bargain individually or collectively as they desired according to the provisions of Section 7a of the National Industrial Recovery Act, twice interpreted by Administrator Johnson and General Counsel Richberg of NRA as meaning that any group of employees who wish to bargain through union representatives are free to do so but the company need not recognize the union as the representative of employees who do not wish to be represented by it.

Union Demands

Other demands made by the union were for a minimum hourly wage of 65c. per hr., 62.5 per cent above the minimum provided in the code under which the company was operating; and a maximum working week of 30 hr., 25 per cent below the code requirements. The company expressed its reasonable objections to these demands and its willingness to continue discussion of them with the union representatives. Without making any reply or giving any notice to the company, seven days later, on July 13, a strike was called to become effective the following Monday. Hundreds of pickets surrounded the plant that day, most of them never having worked for the Kohler Co. and only a few were residents of Kohler Village. No attempt was made to operate the plant, but 200 employees, including some young women, were forced by the threats and intimidations of the pickets to remain in the plant for 12 days. More than 1500 of the 2400 employees petitioned the village authorities for protection so that they could return to work, but to no avail. For two weeks the model village was overrun with hoodlums who had never worked or lived there before.

Pickets blockaded roads to prevent passage of employees or materials; they forcibly turned back loyal employees returning to work, they halted shipments of coal to the Kohler plant, thus threatening the water supply, fire protection and sewerage disposal system of the village, which all were provided from the plant. The two local policemen were augmented by special officers designated from among Kohler residents and from neighboring communities. No strike breakers nor company police were used.

Strikers Attack Property

On Friday, July 27, after the strike had been going on for two weeks, a huge crowd, estimated at more than a thousand persons, mostly strangers to Kohler, carried out a well-organized and apparently carefully planned assault on Kohler Co. and Kohler Village property. Practically all the windows in the factory were broken by flying bricks and stones, including those of the medical department in which the company doctor was then treating injured picketers without charge. After the mob had wrecked a police car, stoned the car containing Miss Nichols, the county probation officer, had attacked the general office building and were about to rush the office where girl telephone operators were working, the local peace officers released gas bombs in a futile attempt to disperse the mob. The attempt failed and when the mob renewed its attack, this time against the village recreation hall, the police used their guns and drove the rioters from the village. All this took place in the glorious name of "union recognition," for the attack was too well planned and organized to have been the effort of an unled mob. After this dreadful day National Guard troops relieved the village, an action which union "leaders" protested vigorously.

(Concluded on Page 65)

September Pig Iron Output Off 12 Per Cent

PRODUCTION of coke pig iron in September totaled 898,043 gross tons, compared with 1,054,382 tons in August. The daily rate in September, at 29,935 tons, showed a loss of 12 per cent from the August rate of 34,012 tons a day.

There were 62 furnaces in blast on Oct. 1, making iron at the rate of 28,215 tons a day, compared with the same number of furnaces on Sept. 1, operating at the rate of 31,295 tons a day. Four furnaces were blown in during September and four were blown out or banked. The Steel Corporation took two off blast and put one in operation, independent steel companies blew two in and blew out or banked one, and merchant producers put one in and took one off blast.

Among the furnaces blown in are the following: A Donner furnace, Republic Steel Corpn.; one Cambria, Bethlehem Steel Co.; one Lorain, National Tube Co., and the Jackson furnace, of the Jackson Iron Co.

Furnaces blown out or banked included: One Swede, Alan Wood Steel Co.; one Donora, American Steel & Wire Co.; one Monongahela, National Tube Co., and one Zug furnace, of the National Steel Corpn.

Daily Average Production of Coke Pig Iron

Gross Tons

	1934	1933	1932	1931
January	39,201	18,348	31,380	55,299
February	45,131	19,798	33,251	60,950
March	52,243	17,484	31,201	65,556
April	57,561	20,787	28,430	67,317
May	65,900	28,621	25,276	64,325
June	64,338	42,166	20,935	54,621
½ year	54,134	24,536	28,412	61,356
July	39,510	57,821	18,461	47,201
August	34,012	59,142	17,115	41,308
September	29,935	50,742	19,753	38,964
October	.....	43,784	20,800	34,848
November	.....	36,174	21,042	36,782
December	.....	38,131	17,615	31,625
Year	.....	36,199	23,733	50,069

Production of Coke Pig Iron and Ferromanganese

Gross Tons

	Pig Iron*		Ferromanganese†	
	1934	1933	1934	1933
January	1,215,226	568,785	11,703	8,810
February	1,263,673	554,330	10,818	8,591
March	1,619,534	542,011	17,605	4,783
April	1,726,851	623,618	15,418	5,857
May	2,042,896	887,252	10,001	5,948
June	1,930,133	1,265,007	10,097	13,074
½ year	9,798,313	4,441,003	75,642	47,063
July	1,224,826	1,792,452	10,188	18,661
August	1,054,382	1,833,394	8,733	16,953
September	898,043	1,522,257	7,100	13,339
October	.....	1,356,361	.....	16,943
November	.....	1,085,239	.....	14,524
December	.....	1,182,079	.....	9,369
Year	.....	13,212,785	.....	136,852

*These totals do not include charcoal pig iron. The 1932 production of this iron was 15,055 gross tons.
†Included in pig iron figures.

Merchant Iron Made, Daily Rate

Tons

	1934	1933	1932
January	7,800	2,602	6,256
February	7,071	2,863	7,251
March	7,197	2,412	7,157
April	8,838	1,908	5,287
May	9,099	3,129	4,658
June	9,499	4,088	6,090
July	7,880	6,783	3,329
August	6,043	7,756	3,070
September	5,986	10,034	3,213
October	....	8,634	4,286
November	....	7,639	4,435
December	....	8,358	3,674

Production by Districts and Coke Furnaces in Blast

Furnaces	Production (Gross Tons) September (30 Days)	Production (Gross Tons) August (31 Days)	October 1 Number in Blast	October 1 Operating Rate, Tons a Day	September 1 Number in Blast	September 1 Operating Rate, Tons a Day
New York:						
Buffalo	50,938	45,685	4	1,765	3	1,475
Other New York & Mass.	17,246	18,338	2	575	2	590
Pennsylvania:						
Lehigh Valley	23,440	26,118	3	780	3	845
Schuylkill Valley	11,313	15,504	0	....	1	485
Susquehanna and Lebanon Valleys	11,444	14,207	1	380	1	1,775
Ferromanganese	....	....	0	....	0	....
Pittsburgh District	185,209	203,633	10	5,400	11*	5,800
Ferro. and Spiegel	4,006	16,594	1	165	2	535
Shenango Valley	13,776	17,480	1	460	1	565
Western Pennsylvania	19,795	15,008	1	660	1	485
Ferro. and Spiegel	3,094	4,509	1	125	0	....
Maryland	28,067	35,221	2	935	2	1,135
Wheeling District	58,845	65,199	4	1,810	4	1,845
Ohio:						
Mahoning Valley	67,333	81,574	3	1,785	3	1,710
Central and Northern	77,471	99,148	6	2,605	5	2,420
Southern	14,747	13,276	2	515	1	380
Illinois and Indiana	177,295	225,580	10	5,910	10	6,590
Mich. and Minn.	46,193	58,984	3	1,420	4	1,905
Colo., Mo. and Utah	17,879	20,240	2	595	2	655
The South:						
Virginia	....	....	0	....	0	....
Kentucky	12,010	14,744	1	400	1	385
Alabama	57,842	63,340	5	1,930	5	1,715
Ferromanganese	....	....	0	....	0	....
Tennessee	....	....	0	....	0	....
Total	898,043	1,054,382	62	28,215	62*	31,295

*Revised. Midland furnace of the Pittsburgh Crucible Steel Co. was put in operation in August.

Letters to the Editor

Editor, The Iron Age

THE Morro Castle disaster should impress upon the public mind the truth that has long been apparent to engineers, that the housing structures of all public vessels should be made of metal, and not of inflammable wood.

This lesson was learned by the railways years ago and led them to abandon wood for metal in car construction.

Trim of all kinds, partitions and ceilings, even decks and rails, may now—and should—be made of suitable metals. Stainless steel and aluminum in their various finishes lend themselves admirably to this work.

An all-metal ship should hereafter have a great trade-pulling potential.

Henry A. Wise Wood

New York, Sept. 11, 1934.

THE WEEK IN WASHINGTON

Which Way Will New Blue Eagle Fly?

American Business Watches Eagerly to See If Course Will Be to Right or Left

By L. W. MOFFETT
Resident Washington Editor
THE IRON AGE

WASHINGTON, Oct. 2.—Undergoing a major molting, business and industry are watching with concern the new flight of the Blue Eagle. Preened in a distinct change of feathers and greatly altered in body the more or less famous bird, no longer in the aerie of General Hugh S. Johnson, its tempestuous godfather, is soaring to an uncharted destiny. And as it winged its way there is no doubt that business and industry grew nervous. For they say it swung to the left. But the Administration's spokesmen, seeking to reassure, have said there will be no sudden or sweeping changes in its course. One thing is certain: The Blue Eagle will be under the direct guidance of President Roosevelt more than it has been heretofore. Therefore its itinerary is to be determined to a greater degree than in the past by the White House. Yet not entirely by the White House.

Actually, it is safe to say that the future of the National Recovery Administration is not known by any source. Its broad reorganization last week manifestly is only a temporary affair. Much depends on its performance before it is whipped into final and permanent form by Congress. For President Roosevelt has said that he proposes to convert this "emergency" organization into a permanent body, with continued far-reaching control over business and industry.

There undoubtedly will be lively contests over its new policies. Morever, there is unquestionably a growing section of business and industry which not only has lost enthusiasm over NRA but would like to see it abolished. But its permanence appears to be a certainty. This seems to be so because the Administration will insist upon it. And the Administration will continue to have strong control over the new Congress unless the November elections develop an upset altogether unexpected at this time. Also organized labor, more firmly in the saddle than ever, proposes further capitalization of its power under Section 7-a of the Recovery Act. The present mood of a large section of business and industry likewise wants NRA made permanent, though important groups are strongly urging that it be vastly changed so as to afford more self-government, less Federal control and diminution of labor representation. Such a change does not appear to have the remotest chance of legislative enactment. It is a certainty that if business and industry find that the newly reorganized NRA turns to policies that hamper them increasingly the large element favoring continuance of NRA will be greatly reduced. Consequently it can be said that the test period for reaction from business and industry is at hand.

Uncertainty Is Disturbing

Hardly anything is so disturbing to business and industry as uncertainty. Hence effectuation of the long-awaited reorganization of NRA at least removed this irritant to the extent of making known what its character would be. Virtually without a pilot, drifting almost aimlessly since General Johnson went on his vacation early in July, NRA had slowed down to a point where it was a question if it could function effectively much longer. Dissensions become more acute and though General Johnson months ago said it was no longer a one-man job and proposed a board to operate it, he broke sharply with others in the administration, particularly Donald R. Richberg, the new dominating force in NRA outside the President. The stormy administrator in his recent New York broadcast also enraged organized labor and irritated the President because of his dragging in the name of Associate Justice Brandeis as an adviser. His resignation thus became a foregone conclusion. Hastening of reorganization was likewise made inevitable. Policies that will be submitted for legislative action will be brought to light sooner than had been contemplated.

Policies Are Unknown

It would be sheer speculation to say what these policies will be, for it is evident the Administration itself can determine them definitely only through developments. Broadly, however, it may be said that there is a distinct trend toward shortening hours of labor without change in wages, and a minimizing of price control and determination to retain collective bargaining in its present form or on even more favorable terms for labor. Majority representation has become the established principle.

Looking at the newly reorganized NRA there are seen widely divergent

views on economic and social matters. Presumably this variety of thought was purposely merged into the organization in order that the President might get a wide range of suggestions on issues which he is expected to determine as the new foundation for NRA. Actually its direction in new channels was provided by the President last Thursday when he set up two new boards and they are shot through with a pro-labor and even socialistic thought, though mixed with distinctly conservative thought, favorable to business and industry.

The first board, which was organized by phone on the day it was established, is the National Industrial Recovery Board, headed by S. Clay Williams, former president of the Reynolds Tobacco Co., known as one of the conservative members. He was elected by the board members.

Other members are:

Arthur D. Whiteside, president, Dun & Bradstreet, Inc., and one time divisional administrator of NRA, known as the other conservative member.

Sidney Hillman, well known socialist, and president of the Amalgamated Clothing Workers.

Leon C. Marshall, former professor at Johns Hopkins University and labor specialist.

Walton H. Hamilton, professor of constitutional law at Yale University.

To act in an "advisory capacity" to the new NRA board and in other capacities, the President also appointed the Industrial Emergency Committee, made up of the following members:

Harold L. Ickes, Secretary of the Interior.

Frances Perkins, Secretary of Labor.

Chester C. Davis, Agricultural Adjustment Administrator.

Harry L. Hopkins, Federal Emergency Relief Administrator.

Donald R. Richberg, general counsel of NRA, who was made director of the committee.

The two boards constitute the "executive" and "legislative" branches of NRA. The "judicial" branch remains to be set up.

Colonel George A. Lynch, close friend of General Johnson, will remain as executive officer of NRA, a position to which he was named by General Johnson.

With Mr. Hillman, Mr. Marshall, Miss Perkins, Mr. Hopkins and Mr. Richberg in the prominent roles they have been given, it is clear that labor reaped bountifully in the reorganization of NRA.

Mr. Richberg is rated now as being second only to the President in influence in the administration. Though his attitude toward industry on the whole is held to have been fair, it is but natural that, having long been counsel for the railroad labor union, he has strong leanings toward organized labor. Nevertheless, he has come to grips with prominent officials of organized labor. He is widely recognized as a man of unusual ability and of integrity and will fight for principles he espouses even if opposition comes from a friendly camp. His differences with General Johnson emphasize this fact, though Mr. Richberg still retains warm personal regard for the former administrator. Mr. Richberg told THE IRON AGE that so far as he now knows he will continue to be an administration member of the steel code authority. No one has defended the steel code more strongly than Mr. Richberg when he struck back at the Darrow board report attacking that code. On the other hand Mr. Richberg made some sharp remarks on the steel code in a recent speech in Baltimore.

A Plan of Experimentation

The President's plan with regard to the new NRA will be like that of many other plans he has adopted. It will be a plan of experimentation and

Here Are the Men Who Will Compose NRA Administrative Board

S. CLAY WILLIAMS, 50 years old, native of North Carolina; attorney; University of Virginia, class 1908; practiced at Greensboro until becoming general counsel of Reynolds Tobacco Co., of which he became president in 1931; served in that capacity till 1933 when he was made chairman of executive committee of board of directors and chairman of industries committee in negotiating with NRA; been in Washington almost from beginning of NRA and has been negotiating cigarette makers' code; was industrial member of old National Labor Board; second chairman of Industrial Advisory Board and recently was elected chairman of Business and Planning Council established by Secretary of Commerce Roper.

SIDNEY HILLMAN, 47 years old, born in Seagare, Lithuania; came to United States at age of 20; active in labor affairs, an avowed Socialist, though known by the more radical element as a "conservative"; member of NRA Labor Advisory Board since its inception; given rabbinical education, he turned to labor activities and has been outstanding strike leader and has headed several prominent unions; president United Garment Workers.

ARTHUR D. WHITESIDE, head of Dun & Bradstreet, Inc., New York, formerly was divisional administrator of NRA; came to organization by request of General Johnson as deputy administrator; was in charge of some of most important codes, including retail code; been strong advocate of proper price protection.

LEON C. MARSHALL, 55 years old, born Zanesville, Ohio, formerly vice-chairman National Labor Board and for some years associated with Brookings Institution; most of adult life spent as college professor, starting 1900 with chair of economics, Ohio Wesleyan University; technically on leave as professor in institute of law at Johns Hopkins University; formerly chairman department of political economy, University of Chicago; assistant deputy administrator for policy of NRA; secretary of advisory council Department of Labor, 1918; served Government during World War in handling labor relations.

WALTON HAMILTON, 53 years old; born in Tennessee; author of books on economic matters, including labor problems; law professor at Yale; chairman NRA Advisory Council and member NRA Consumers' Advisory Board; former professor of economics Robert Brookings Graduate School of Economics and Government; attended Webb School, Bellbuckle, Tenn.; Vanderbilt University and Universities of Texas and Michigan; received honorary master's degree from Yale; began professional career as instructor in preparatory schools; later returned to Universities of Texas and Michigan as instructor; became assistant professor political economy University of Chicago, 1914, and professor of economics at Amherst, 1915.

it has been said it will be done through evolution over a period of years, with the Industrial Emergency Committee acting as an adviser. Mr. Richberg said emphatically, however, that the committee is not going to run the NRA but that it is its duty to make recommendations to the President concerning problems affecting NRA and other emergency agencies and to determine "with the approval of the President the general policies of the administration of the National Industrial Recovery Act." This means, he said, that the Industrial Emergency Committee acts, first, in an advisory capacity to the President and, second, under his direction, to coordinate the administration of such policies by all the governmental agencies concerned.

The National Industrial Recovery Board will administer Title I of the Recovery Act under the direction of the President "just as other emergency agencies are administered."

The Industrial Emergency Committee is composed of the heads of departments or agencies dealing with "problems of relief, public works, labor disputes and industrial recovery, together with allied problems of agricultural recovery," as pointed in the President's executive order, issued at the same time he issued his order setting up the National Industrial Recovery Board.

Richberg Will Be a Force

While Mr. Richberg said it should be obvious that the committee of which he is director is not intended to manage the operations of any of the departments or agencies represented on the committee, the belief prevails nevertheless that it will be a strong influence in shaping NRA policies. Particularly is it thought that Mr. Richberg himself will be a powerful force in this direction.

The stir that was created over the setting up of the new NRA board apparently was the reason Mr. Richberg at a jammed press conference last Friday sought to reassure business and industry.

"The most important service that can be performed at the present time," said Mr. Richberg, "is to provide a continuing assurance against sudden or sweeping changes of policy and of deliberative action after full consideration and discussion with opportunity for all those interested to know what is under consideration to be heard."

Despite this assurance, however, there is a strong drive by organized labor, with administration support, for shortened hours without reduction in wages and the question is now before the new Administrative board. It is looked upon as a renewal of the administration's effort to accomplish what the President endeavored to accomplish last spring when addressing the Washington meeting of code authorities of the country. Sharp reaction came from industry generally and the attempt proved a failure. Bolstering the movement is organized labor's revival of its drive for the 30-hr. week, a lively subject before the San Francisco convention of the American Federation of Labor. It is doubted that organized labor expects to get Congress to pass 30-hr. week legislation but is certainly expecting to slice down the 40-hr. week, largely standard for all industries, perhaps to a 36-hr. week.

Cotton Government Problem

Exercising authority conferred upon him by the Recovery Act—an authority some manufacturers have indicated they stand ready to test in court, if necessary—the President last month issued an order reducing the hours of cotton garment workers from 40 to 36 hr. It was proposed that the necessary amendment to the cotton textile code making this change become effective yesterday. But, explaining that the NRA is being reorganized, the effective date was postponed till Oct. 15. Meanwhile the new board is hearing the case through a committee of three. The move to shorten the hours in the cotton textile industry was led by Mr. Hillman, now a member of the board which will pass on the subject. Morever, it is believed the amendment will be adopted. It would have the effect of raising rates for piece workers and leaving unchanged the wages of day workers. The affected manufacturers through their code authority have agreed to accept any decision reached by the President.

The cotton textile industry is known as a "label" industry, making goods that are retailed and it is held would be difficult to sell if they were not labeled with the Blue Eagle. Yet Mr. Ford's snubbing of the Blue Eagle does not seem to hurt his business. The 36-hr. week in the cotton textile industry, it is said, is being offered as a "trial balloon." Getting by in that industry it is believed strong effort will be made for its adoption in industries generally. It is known, for instance, that organized labor now is prepared to demand a shorter week, said to be fixed at 36-hr., in the automobile industry when the latter's recently renewed code expires early in November. Incidentally, the automobile industry is represented as having lost most of its interest in its code, one of the simplest in the entire NRA category, containing as it does only the sections required by the Recovery Act, including 7-a, together with a few trade practices and no price protection. It is one of only two or three carrying the much-discussed merit clause, which organized labor again is seeking to knock out.

Against Price Control

The attitude of the new NRA board with regard to price protection is expected to come to light before long. Meanwhile, the move from any form of price protection, except for natural resource industries, has gathered momentum. The President himself has indicated that there will be further minimizing of price control and has expressed strong doubts as to price fixing and even price posting. Also he has intimated that he will ask Congress to restore the anti-trust laws in full as they relate to these practices. His idea, it has been indicated, is to simplify codes, and to retain only provisions against child labor, the collective bargaining section and the minimum wage and maximum hour requirements. With NRA shaping up a policy of this sort it is evident industry, with insufficient protection against price cutting and with higher wage costs, would generally be ready to see NRA discarded entirely.

The price problem, however, is proving to be difficult, and perhaps the strongest support for continued price protection comes from labor itself, holding it is necessary to maintain wages, while the most powerful element to break it down comes from consumer interests as represented by the NRA Consumers' Advisory Board and some members of the Research and Planning Division of NRA. Supporting this latter attitude is the rising protest against increased costs of living which are making the country increasingly "consumer conscious," an important factor during a political campaign.

Mr. Richberg said that individual considering by industries will govern the matter of prices, in his opinion. He explained that conditions are so different in the various industries that each should be considered individually. Regarding the anti-trust laws, he said industries adhering to codes are exempt but that those operating monopolistically and restraining competition or producing unfair competition are not exempt.

The final move in "decentralizing" NRA will be the setting up of a judicial branch. With code violations becoming widespread, some committed with almost open defiance and apparent readiness of violators to go to court, this will be an extremely important move. It is believed that sharing in the work of code enforcement through this branch will be the Federal Trade Commission and the Department of Justice. Reports that the Commission will be abolished and its work taken over by the Department have been circulated but are accepted with much doubt as to their accuracy.

Keystone Steel & Wire Co., Peoria, Ill., has declared a dividend of 50c. a share on the common stock and the regular quarterly disbursement of $1.75 on the preferred stock. This is the fourth dividend of 50c. on the common to be paid this year.

Heating and Plumbing Lead In Home Loan Applications

WASHINGTON, Oct. 2.—Twenty-nine per cent of the money advanced to home owners in the 718 modernization loans reported to the Federal Housing Administration during the week ended Sept. 22 is being spent in new heating equipment and for plumbing improvements. Another 3 per cent is being used in improving the facilities of bathrooms and 2 per cent is being spent in renovating obsolete kitchens.

While less than 1000 of the 7000-odd banks and financing agencies operating with the approval of Federal Housing Administration in the home rehabilitation drive reported for this period, some idea of the trend of the public mind may be had from the figures given.

Of the loans reported in advance on the week given, 609 contemplated jobs concerned the use of materials in which the durable goods industry is interested. These were listed as follows:

Heating repairs, 265; plumbing repairs, 252; bathroom remodeling, 56; improvements to metal kitchen equipment, 36. The repair of roofs, which includes replacement of rusted and outworn gutters and down spouts, was listed in 169 instances in the applications for loans granted. As the winter season approaches it is expected that applications for such loans will increase by bounds.

Durable Goods Benefited

In view of the fact that the Federal Housing Administration is only getting into its stride on the first phase of the better housing movement, the benefit which is certain to come to the durable goods industries through this drive becomes apparent. It is impossible to state at this time just what the demands on the pig iron, scrap and steel trades will be, but they promise to be sizable. This must inevitably mean a substantial slash in the unemployment list in a line where industrial activity has been at lowest ebb.

That the need for aid from the private lending agencies which have the approval of the Federal Housing Administration in this modernization work is not confined to any one class is indicated by reports of the lenders.

The list of borrowers is led by clerical employees, these numbering 135. Mechanics (skilled) come near the top with a total of 96. Business men, listed as sole owners of their varied businesses, numbered 92.

Professional men and landlords of rooming houses and small apartments run about equal, the former receiving loans in 26 cases and the latter in 28 instances.

Since there remains some confusion in the public mind regarding this financing service a paragraph regarding it may be apropos.

The Federal Housing Administration does not lend money. It does, however, insure the loans made under its own regulations by private lending agencies. All that is required of the would-be borrower who wishes to repair or modernize his home is that he apply to his bank, building and loan association, his contractor or a building materials company and make known his needs. If the applicant can qualify as a "good risk" the necessary loan will be forthcoming without red tape.

Effect of Loans is Speculative

Just what the rapidly increasing number of loans will mean to the plumbing pipe, the water main cast iron pipe, the plumbers' supplies and kindred industries is at present a matter of speculation but FHA officials report a definite upturn in the business of the trade already has developed.

Another factor which is certain to have a most wholesome effect on the industry is to be found in the report of the urban housing survey recently concluded under direction of the bureau of foreign and domestic commerce of the Department of Commerce. This shows that in some cities from 18 to 26 per cent of the population is without running water and that 66 per cent of our total urban population is without access to bathtubs or showers.

Still another revelation of the survey is that in Boise, Idaho; Pueblo, Colo.; Wheeling, W. Va., and a number of other small cities approximately half of the dwelling units are heated by old-fashioned coal or wood stoves.

Selling the Good Housing Idea

The Federal Housing Administration is stressing through all its channels of publicity that good housing, housing of the type to which every American citizen may lay claim, is an investment in good citizenship. It is seeking to drive home the fact that no city can afford poor housing; that adequate heating and plumbing is not merely a convenience but a labor, time and health saving necessity. It is daily showing that slum conditions are too expensive for any city to maintain. It is proving conclusively that every city deficient in the pumbing it provides for its citizens pays heavily in police, fire and health penalties for its negligence.

Since the industrial and financial collapse of 1929 many new articles fabricated of steel have come on the market at prices within the means of virtually everyone. This has been true especially of the heating and plumbing trade. Air conditioning of home and shop has been brought through the experimental stage and permanently established. The cost of this remains high, but it, largely through the efforts of the Federal Housing Administration, is rapidly being brought down. The immediate economic result of this means the reemployment of thousands of workers who have long been idle.

At one time the building industry maintained more than 5,000,000 persons in steady employment. In other words one out of every five persons in the country owed his livelihood directly or indirectly to the building industry. A start to get these idle millions back into the building trade line-up has been made. The iron and steel industry and its allied lines are being relied upon much to further this cause and it has pledged its wholehearted support to the Federal Housing Administration in this campaign. This has been made evident by the large number of representatives from these industries attending group conferences with FHA officials.

Efforts to develop mass construction of an all-steel house which will never need repairs may become an actuality before the work of the Federal Housing Administration has passed into history.

The construction of such a house today, whether with the approval and insurance of the Federal Housing Administration or through purely private initiative, continues to be a problem. The first cost would be high for the family of moderate income.

Just the same, progress is being made. The builders of the best homes in Washington as in other cities are beginning to use prefabricated steel in their $40,000 to $100,000 residential structures. The president of the capital's largest home rental and apartment house management company has recently published an article which declares such homes, to be sold at from $6,000 to $7,000, a certainty within five years.

Will Boost New Construction Too

The Federal Housing Authority has thus far concerned itself entirely with the business of home repair and modernization. It will, however, later announce a program of encouragement in new construction. There is no logical reason why it should not lend its influence to the creation of the all-steel home, provided such a building can be evolved at a cost within the means of the person with modest in-

come; the person Federal Housing Administration was created to serve.

The best architects of the country have for a number of years been engaged in preparing plans for the all-steel home. A composite review of their efforts would seem to make an ill-favored house. They appear to have lent their talents to an adaptation of the English manor, the entire life of the family to be lived in a measure of seclusion above the first floor.

One Story Trend

It is doubtful if the average American family would be content to forego the pleasures of a first floor dining room, living room, library and lounge for a restricted living room upstairs while an idle motor car or two and an air conditioning plant took over the first floor. There is, in Washington, at least, a definite trend to one-story dwellings.

This, however, is of little consequence. If the people want an all-steel home they shall have it. The architects will devise something to meet the popular demand and the Federal Housing Administration will likely help the hungry home buyer to attain it.

Under the plans so far advanced in this connection is one which would abolish open fireplaces and therefore chimneys. It would be air-conditioned, the machinery for this being stationed on the first floor. There would be no need for the usual heating arrangements, hence no basement.

The roof, even in the Dakotas, Minnesota and Montana, would be built flat, regardless of the snowfall. This the architects would convert in the summer time into a playground for the children.

In most of the plans there is a total absence of provision for porches. This shatters another American tradition. The American home, particularly that home south of the Mason-Dixon line, is no home without its rocking chair and hammock, its sagging bench and the few wilted stems of vegetation in a dusty looking-glass.

Flatly, FHA officials say, it won't do. The architects shall have to get up something better. And they will do it—almost any day now. Moreover, the Federal Housing Administration, convinced that this is in reality the home of tomorrow, will help the home-hungry wage earner in buying it.

Trustees of the St. Louis-San Francisco railroad have asked the United States District Court at St. Louis for authority to destroy 30 small and obsolete locomotives of the 2-6-0, 4-6-0, 4-4-0 and 0-2-0 type, from which the road expects to realize $11,000 to $12,000 from the sale of the scrap and in addition recover a number of usable parts.

Supplementary Machinery Codes Are Presented — Other NRA Doings

WASHINGTON, Oct. 2.—Hearings were held Sept. 25 on proposals to place the coal-cutting-machinery industry, the coal-mine-loading-machine industry and the mine-car-manufacturing industry under codes supplemental to the code for the machinery and allied products industry.

John W. O'Leary of the code authority for the machinery and allied products industry, submitted amendments defining the industries to be covered by the supplemental codes. Hearings were held on these amendments and on the codes themselves. Mr. O'Leary said the amendments and definitions had been approved by all affected interests except the Gray Iron Foundry Society. Negotiations with that industry are in progress. Final approval of supplemental codes requires withdrawal of all objections.

Supplemental codes for the coal-mine-loading-machine industry and the coal-cutting-machine industry were presented by W. E. Goodman, vice-president of the Goodman Mfg. Co., Chicago, and member of the code committee. A representative of the Consumers' Advisory Board of NRA suggested these industries be covered by a single code.

The supplemental code for the mine-car-manufacturing industry was presented by Carroll Burton, chairman of the code committee for that industry. He said that the industry is a small one embracing 23 concerns, of which 15 were represented in the group presenting the code. The same group, he stated, represents 90 per cent of the volume of the industry, which has an aggregate capital of $9,000,000 and in 1929 employed 1621 persons.

PUMP MANUFACTURING

The pump manufacturing industry's supervisory agency has asked the NRA to uphold its interpretation of "current prices" in filing with the code authority sales quotations on centrifugal pumps. Better code compliance and protection to the consumer would result, industry representatives claimed.

The code provides that "current prices" shall be filed with the industry's code agency. Industry spokesmen said past methods of filing prices under the code proved ineffectual. The supervisory agency could not administer the provision satisfactorily because of the lack of properly comparable price data and industry. Members themselves could not tell what "current prices" were, it was said at the hearing.

ELECTRIC TOOL

Hearing on the proposed code for the electric tool industry will be held Oct. 10, in the Commerce Building. The hearing will be in charge of Dexter A. Tutein, acting deputy administrator. This code is supplementary to the code for the electrical manufacturing industry. It deals with administrative and trade practice rules, and contains no labor provisions. The National Electrical Manufacturers Association, claiming to represent 84 per cent of the industry, sponsors the code. It is proposed to establish a price-filing association, classification of customers, classification of products, and a schedule of maximum discounts and most favorable terms.

CORRUGATED ROLLED-METAL CULVERT PIPE

The code authority for the corrugated rolled-metal culvert pipe industry, has asked NRA approval of a $30,000 code administration budget to cover estimated expenses for Sept. 1, 1934 to Aug. 31, 1935. The budget lists the following itemized expenditures: $10,000 for salaries; $8,600 for office expenses, and $11,400 for general expenses. Any objections should be submitted to room 4033, Department of Commerce Building, before Oct. 9.

WIRE ROPE

The NRA has given notice that any objections, criticisms or suggestions concerning a proposed amendment to the code for the wire rope and strand manufacturing industry to make mandatory contributions by members of the industry to code administration expenses, should be filed at room 510, 1518 K Street, N. W., before Oct. 9.

TUBULAR SPLIT AND OUTSIDE PRONGED RIVET

Approval of the supplemental code of fair competition for the tubular split and outside pronged rivet industry, a division of the fabricated metal products manufacturing and metal finishing and metal casting industry, has been announced. The industry is defined in the code, mainly devoted to fair trade practice, as the manufacturing for sale "of tubular, split, and outside pronged rivets and caps made of steel, brass, copper, iron, aluminum, or other suitable metals."

Hours and wages are the same as in the master code for the fabricated metal products manufacturing industry.

SPROCKET CHAIN

Any criticisms or suggestions concerning the proposed budget submitted for NRA approval by the supplementary code authority for the sprocket chain industry, a division of the machinery and allied products industry, must be forwarded to Dexter A. Tutein, room 4023, Commerce Department, before Oct. 5. The supplementary "code authority also asks termination of Administrative Order X-36, under which a member is exempted from contributing to the sprocket chain code authority" expenses if the member's principal business is covered by some other code. Amount of the budget is $5,142.86, to cover expenses from Aug. 1, 1934, to Dec. 31, 1934.

MALLEABLE IRON

The code authority for the malleable iron industry has submitted for NRA approval a proposed modification of the industry's approved code. The amendments would empower the code authority to prepare a budget for Administration approval, and after approval, to make expenditures called for under the budget to be provided by assessment. Any objections must be submitted to room 4023, Department of Commerce Building, before Oct. 6, 1934.

STEEL PACKAGE AND BARREL AND DRUM

Requests for changes in the coverage period of sales contracts specified in codes for the steel package manufacturing and the stan-

dard steel barrel and drum manufacturing industry, both divisions of the fabricated metal products and metal finishing and metal coating industry, have been approved. Under the approval order, "contracts entered into during the first six months of any year, or the month preceding this first six months, shall expire on June 30 of such year and all such contracts entered into during the second six months of any year, or the month preceding this second six months, shall expire on Dec. 31 of such year."

Previously, all contracts expired at the end of a calendar quarter, but identical provisions in both codes specify that changes may be authorized by the supplementary code authority, upon request by a majority of industry members, if approved by the Administrator. The change does not affect the six-month maximum period of contract coverage specified by both codes.

NON-METALLIC FLEXIBLE CONDUIT

Public hearing on a proposed code of fair competition for the non-metallic flexible conduit industry, submitted by the National Electrical Manufacturers Association, will be held in room 2062, Department of Commerce Building, on Oct. 12. The code is supplemental to the electrical manufacturing industry code. It adopts the minimum wage, maximum hour and other labor provisions of the basic code, but would establish its own sections on prices and terms of sale including a price filing system. Eight fair trade practice rules are proposed.

CODE AUTHORITIES APPROVED

Approval of the following code authorities has been announced by the NRA:

Open Steel Flooring (Grating) Manufacturing, Supplemental Code Authority: C. H. Lewis, Irving Iron Works, Inc., Long Island City, N. Y.; H. B. Lexterman, Blaw-Knox Co., Blawknox, Pa.; W. J. Hamilton, secretary Hendrick Mfg. Co., Carbondale, Pa.; H. H. Bunker, Kerlow Steel Flooring Co., Jersey City, N. J.; B. L. Fralick, Universal Mfg. Co., Novi, Michigan; A. E. Sangdahl, William F. Klemp Co., Chicago; W. P. Ladd, Gary Structural Steel Co., Gary, Ind.

Concrete Mixer Manufacturing, Sub-division Code Authority: A. A. Levison, Blaw-Knox Co., Blawknox, Pa.; L. S. Holden, Construction Machinery Corpn., Waterloo, Iowa; Walter Muller, Ransome Concrete Machinery Co., Dunellen, N. J.; B. F. Devine, Chain Belt Co., Milwaukee and Lion Gardiner, Jaeger Machine Co., Columbus, Ohio.

FAIR PRACTICE COMPLAINTS COMMITTEES NAMED

The NRA has announced its approval of the membership and plans of procedure of trade practice complaints committees for the following industries:

Machine Screw Manufacturing Industry (a division of the fabricated metal products industry)—R. A. Gunn, Federal Screw Works, Detroit, Mich.; W. H. Hill, Scovill Mfg. Co., Waterbury, Conn.; A. D. Peck, American Screw Co., Providence, R. I.; E. A. Thatcher, United Screw & Bolt Co., Chicago; and E. M. Whiting, Pheoll Mfg. Co., Chicago; all members of the industry's code authority.

Compressed Air Industry—D. C. Koefe, Ingersoll-Rand Co.; J. M. Brown, Sullivan Machinery Co.; and A. E. Goodhue, Chicago Pneumatic Tool Co., all of New York; W. H. Leonard, Cardner-Denver Co., Quincy, Ill.; and C. E. Searle, Worthington Pump & Machinery Corpn., Harrison, N. J. These members also constitute the present membership of the industry's supervisory agency.

Cap Screw Manufacturing Industry—George P. Byrne, New York; R. M. Heames, Allied Products Corpn., Detroit; W. H. Hill, Scovill Mfg. Co., Waterbury Conn.; A. M. Jones, Buffalo Bolt Co., North Tonawanda, N. Y.; H. D. North, Ferry Cap & Screw Co., Cleveland; and H. E. Penfield, Chicago Screw Co., Chicago, all members of the industry's code authority.

Cutting Die Manufacturing Industry (a division of the fabricated metal products industry)—John J. Adams, John J. Adams Co., Worcester, Mass.; Wilson Palmer, United Shoe Machine Co., Beverly, Mass.; and Charles Messner, St. Louis Cutting Die Co., St. Louis, code authority members; and Richard F. Hingston, to be neutral agent.

CODE AUTHORITY ADMINISTRATION MEMBERS

Francis E. Lee, New York, has been named administration member of code authorities for the horseshoe and allied products manufacturing industry, the die casting manufacturing industry, and the machine-applied staple and stapling machine industry.

W. A. Hastings, Aluminum Products Co., La Grange, Ill., has been appointed to the aluminum code authority to represent concerns not members of the Association of Manufacturers in the Aluminum Industry.

Steel Labor Relations Board Cites Progress

WASHINGTON, Oct. 2.—Accomplishments of the National Steel Labor Relations Board, according to Secretary Perkins, include the settlement of disputes involving approximately 15,000 workers directly and many more indirectly. Receiving the first report of the board, Miss Perkins gave out a resume of its work since it was set up three months ago.

One of its outstanding efforts, it was stated, was the settlement of the controversy between the Amalgamated Association of Iron, Steel and Tin Workers and the Republic Steel Corpn., which the report said had refused to renew wage contracts involving 35,000 employees.

Other cases adjusted by the board were listed as follows:

Complaint and petition of employees of the Apollo Steel Co., Apollo, Pa., alleging denial of collective bargaining rights and requesting an election.

Strike of employees of the Greer Steel Co., Dover, Ohio, based on a demand for equal distribution of work without discrimination against union members.

Request for an election by employees of the Standard Tin Plate Co., Canonsburg, Pa.

A similar request on the part of employees of the West Virginia Rail Co., Huntington, W. Va.

Complaint of employees of Clayton Mark & Co., Chicago, charging that the company refused to deal with the union committee.

Complaint against the Worth Steel Co., Claymont, Del., alleging the discharge of an employee for union activity.

Complaint of employees of the Sparrows Point, Md., plant of the Bethlehem Steel Co. charging denial of collective bargaining rights.

Complaints of Amalgamated lodges, charging denial of collective bargaining rights have been settled in all but one case without recourse to an election, the report said. Assurances given the board by employers that they were willing to meet and deal with Amalgamated committees formed the basis of adjustment in the Apollo, Clayton Mark and Bethlehem cases, it was declared.

An election by employees of the West Virginia Rail Co. was held under the board's supervision. The election resulted in a substantial majority for the Amalgamated. This organization, consequently, was certified by the board as "the representative of the employees of the West Virginia Rail Co. for the purpose of collective bargaining with all the rights and privileges vouchsafed by law to such choice and certification."

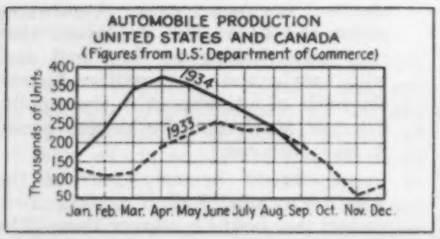
Production Engineering To Be Discussed

RICHARD H. GRANT, vice-president, General Motors Corpn., will be the speaker at a production-engineering dinner to be held in Detroit, Oct. 11, under the joint sponsorship of the Society of Automotive Engineers, and the Detroit section of the society.

The dinner will conclude two days of technical sessions on production engineering arranged by the Society's Production Activity, W. H. McCoy, vice-president. The program arranged for these two days comprises the presentation of a technical paper on "Cutting Oils and the Fundamental Characteristics in Their Selection" by W. D. Huffman, chief chemist, Chevrolet Gear and Axle Plant, Detroit, in collaboration with C. B. Harding, Sun Oil Co., and W. H. Oldacre, D. A. Stuart & Co. This paper features during the Cutting Oil Session on Oct. 10, under the direction of Chairman A. Ludlow Clayden, vice-president, S. A. E.

The evening of Oct. 10 will be devoted to the Dynamic Balancing Session, with Mr. McCoy, who is manager, experimental production machine shop, General Motors Research Laboratories, presiding as chairman, at which the latest developments on "Balancing Problems in Automotive Engineering" will be described in a paper by Thomas C. VanDegrift and J. M. Tyler, General Motors Research Laboratories.

Continuing the meeting on Oct. 11, the afternoon will be devoted to the Broaching Practice Session, under the chairmanship of Joseph Geschelin, chairman of the S. A. E. production meeting committee. Papers on "Production Experience with Surface Broaching" by E. S. Chapman of the Chrysler Corpn., and a study "Machinery and Equipment Policies in View of the Present Business Situation" by J. E. Padgett, factory manager, Spicer Mfg. Corpn., will feature this session.



THIS WEEK ON THE

Car Makers Enter Change-Over Period In Good Condition; Steel Sales Up

DETROIT, Oct. 2.

SELDOM has the motor car industry entered its annual change-over period in better condition. Stocks of cars in dealers' hands are of moderate volume. Shortages actually exist in the case of retailers who, because of lack of capital, were able to order only a minimum number of vehicles to meet requirements earlier in the year. Special sales of discontinued models are expected to be fewer than usual, and price concessions less drastic.

For years dealers believed that an ideal situation would be to arrive at the end of a model run without a car in stock. There would be no left-overs to sell. All of their resources could be thrown into the merchandising of the new line. In the final quarter of 1933, however, dealers discovered for the first time that such a situation could cause plenty of grief. Some retailers let stocks dwindle to zero without reordering and then were unable to get new cars for weeks because of production delays. Since retail demand never completely halts, competitors with cars took business away from them without even a battle. Salaries, rent and other expenses of running their establishments continued. The experience was a nightmare for many dealers.

Chevrolet Increases Schedule

With the memory still vivid of their tight predicament a year ago, dealers are generally attempting to guard against a repetition this year. Factories, likewise, don't intend to get caught so that output of 1934 models must be resumed after the end of the run has been reached. Chevrolet, for example, has jumped its schedule. Its tentative production for October is put at 58,000 units. The November rate of 35,000 units still stands. It should be borne in mind that all of Chevrolet's 93,000 cars and trucks to be built in the next 60 days consist of 1934 models. Unless this schedule should be cut, Chevrolet's assemblies of current models will total around 840,000 units. Chevrolet still is ordering steel for its Standard passenger cars and its trucks, but has not yet placed any tonnage for 1935 cars.

Factories are in much the same favorable position as dealers. Stocks of parts and raw materials have diminished sufficiently that inventories will be close to the vanishing point when the end of this year's production run is in sight. Last December a leading manufacturer found it necessary to operate one out of three assembly lines on obsolete models in order to clean up excess stocks and then sell these cars to the public at a substantial discount. No company is likely to find itself in such a predicament this year-end.

October continues to appear as the lowest month of the year in number of assemblies. Plymouth, Dodge, Chrysler, DeSoto, Lincoln, Pierce-Arrow, Pontiac, Oldsmobile and Ford will be down at least part of the month as preparations for new models go forward. It is improbable that assemblies for the entire industry will touch the 138,365 units made in October of last year.

Undue Delays Not Anticipated

The final six weeks will be the busiest period during the fourth quarter. Manufacturers will be straining then to get their new cars into the market ahead of competitors, and dealers will be clamoring for stocks. The usual production difficulties will be in the process of being ironed out. However, no delays such as those holding back operations in January and February of this year are anticipated, barring possible labor trouble.

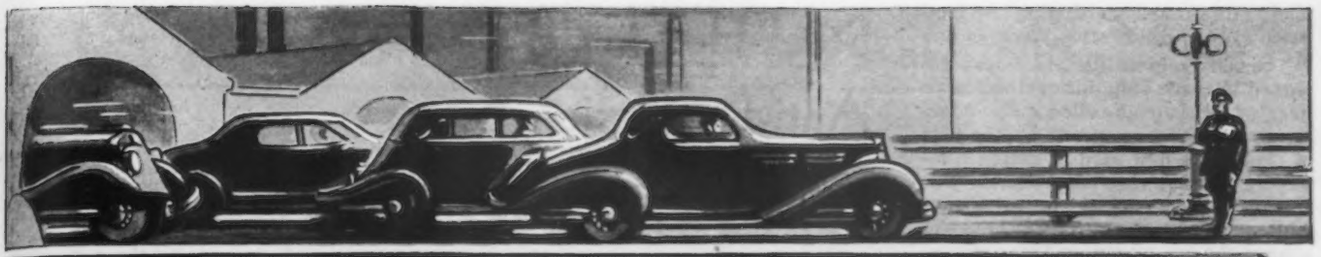
That progress is being made toward new models is attested to by increasing releases of steel for try-out purposes. While the tonnage in the aggregate is not enough to excite the steel trade, it is an improvement over the barren period from which it now is emerging. The slight gain in volume already is discernible in a more cheerful sentiment.

Steel bookings are expected to grow gradually during the month, but there is little hope that mills can look to the automobile industry for strong support until the middle of November or even later. Purchases of steel for initial production runs of new models will be relatively modest.

Despite all of the talk about the glamour being taken away from the New York show, now that it is to be under the management of metropolitan dealers rather than car manufacturers, it will be the starting point for the new automobile selling season, just as it always has. Alfred Reeves, NACC general manager, will continue to boss the affair. Technically the show has been reduced to a local affair, but it still will carry national significance. The only distinguishing mark from last year will be that the salon exhibits of individual manufacturers will be eliminated, the whole show being concentrated in Grand Central Palace.

Improvement Expected Next Year

A recheck of the opinions of leading automotive companies reveals that they have not wavered in their belief that business in 1935 will be 15 to 20 per cent better than this year,



ASSEMBLY LINE

By BURNHAM FINNEY
Detroit Editor, THE IRON AGE

labor disturbances and unsettling monetary policies of the Government to the contrary. It is the anticipation of higher volume that leads the industry to feel that earnings next year will be greater than this year. The trend also is toward lower parts prices.

A leading car maker is figuring on giving more business to outside suppliers the coming year than in 1934. One reason is that parts makers are hungry for contracts and are quoting the lowest prices in several years. Another reason is that this company no longer gets the price advantage it formerly did in buying large quantities of steel, the steel code prohibiting the granting of price concessions. This company's aim is to place sufficient volume of parts with an outside firm to enable it to operate at a high rate and thereby reduce its production costs, passing along a substantial portion of these economies in the form of lower parts prices.

In the case of one car manufacturer it is believed that the labor situation is partly responsible for the decision to farm out considerable work which lately has been done exclusively in its own plants. Its strategy seems to be to have perhaps 50 per cent of the requirements of a certain part made outside and the other 50 per cent by its own departments. If a strike should occur, it would be possible to call upon the supplier for a much larger quantity of parts in an emergency. With parts production spread among 25 suppliers, it is not so easy for union agitators to cause trouble as when manufacture is centered at one location.

Ford to Make Tudor Bodies

Ford will make its Tudor V-eight bodies the coming year at the Rouge plant. It is understood that this model, which Briggs has been making, has constituted about 30 per cent of Ford's production in recent years. As matters stand, it is reported that Briggs next year will make the four-door sedan, Murray, the coupe and Ford, the Tudor. Budd will manufacture commercial car and truck bodies, having received a large contract for these units. Some bodies will be made at Budd's local plant and others at its Philadelphia works.

Department heads at the Rouge plant are said to have been notified to be ready to begin production of parts for the new V-eight Nov. 1. Parts suppliers also are reported to have received releases for deliveries starting then. Ford will continue to make passenger car frames at Rouge. Murray will turn out Ford's truck frames at its Ecorse plant. Whereas the casual observer scarcely could distinguish the 1934 V-eight from the 1933 car, it is said that the change in design for 1935, particularly at the front, will distinctly mark off the new job from its predecessor. The slant of the radiator will be sharper, and the lower front end of the car will be of a more pleasing appearance. The distance between the radiator cap and the driver will be shortened.

Pontiac Parts to Be Made Outside

General Motors is engaged in further divorcing operations of Chevrolet and Pontiac. Recently, the latter's heavy forgings and bumpers have been made at Chevrolet's local gear and axle, forge and bumper plants. For the coming year it is said that all parts which are not interchangeable with the Chevrolet are to be given to outside suppliers. Already contracts have been let for the crankshaft, camshaft, connecting rod and bumpers.

Pontiac now is installing machinery for new model production. Operations will get under way late this month. The six and the eight will have the same body design, according to reliable reports. The engine of the six, except for two less cylinders, will be identical with that of the eight. Simultaneous announcement of the two cars is planned.

It is hard for some observers to understand why the Chevrolet, the Pontiac six and the Olds six are to be so closely grouped in price as to be competitive with each other. Although it is true that each of these divisions of General Motors will compete more severely with the other two, at the same time the new program gives General Motors such thorough coverage of the low medium and low-price class fields as to discourage rival makers. For instance, the corporation will have cars just below, on a level with and just above the lines put out by Chrysler and Hudson. Competition already is tough for the independent manufacturers, and the idea is to make it even tougher, squeezing them entirely out of business.

Some day the entire side of an automobile may be stamped out of a single steel sheet. However, such an evolution is not yet in sight. As a matter of fact, two of the larger manufacturers have decided to use smaller-size sheets next year for front fenders. The main advantage to be derived from the use of larger sheets is a notable scrap saving. Where one company, for example, secured one blank from a certain size sheet this year for the body quarter panel, it will use, in 1935, a larger sheet and get two blanks. Reports are current that sheets 100 in. wide will be in demand soon, but so far it is believed that 90 per cent of the automobile industry's requirements can be satisfactorily met with sheets 75 in. wide or under.

Stories have been circulated to the effect that Great Lakes has been negotiating for purchase of the continuous strip mill now being built by the Ford Motor Co. The reports became so persistent that Great Lakes has issued a formal denial.

New Prices on Strip Mill Products

Manufacturers of cold-rolled strip steel have filed with the American Iron and Steel Institute a new list of commodity prices applying to products sold in the automotive industry, particularly those classified as tubing and molding stock. These new classifications are supplementary to the list of extras now in effect and enable mills rolling strip in narrow widths to compete on more equal terms with strip

sheet mills without changing the base price of cold-rolled strip steel.

The new commodity prices are designed to serve only during the fourth quarter as the cold-rolled strip industry expects to have ready by the first of the year a new card of extras completely reclassifying its products. The newly-filed commodity prices meanwhile are counted on to halt the trend toward the use by automotive consumers of slit sheets rather than narrow strip.

Ford's Rouge plant is reported to be planning to work only two days this week, going down tonight until next Monday morning. Offices, however, will remain open.

It is understood that Ford has decided to substitute carbon steel lamp shells enameled the color of the car for stainless steel on the new V-eight. This will take away from the stainless steel mills their largest single piece of business in the automobile industry. On the other hand, Ford is said to be considering stainless steel for two parts, the tonnage on either one of which would more than offset the loss of the lamp shell. Plymouth and Dodge will have a stainless steel beading on the hood. This is the first stainless material to be used on either car.

Despite published reports that Graham-Paige has taken over the manufacture of the Continental Beacon car, it can be stated authoritatively that no such deal has been closed.

Steel Labor Board Hearing Gets Under Way

WASHINGTON, Oct. 2.—The campaign of the Amalgamated Association of Iron, Steel and Tin Workers to gain recognition from the iron and steel industry through the medium of Section 7-A (collective bargaining) of the recovery act has begun in Pittsburgh. The National Steel Labor Relations Board will remain in Pittsburgh throughout the week hearing cases instigated by lodges of the association.

The hearing today is being held on a petition for an election filed by employees at the Duquesne, Pa., plant of the Carnegie Steel Co. Tomorrow a hearing will be held on a similar petition of employees at the McDonald, Ohio, plant of the Carnegie company. On Thursday hearing will be held on complaints of Open-Hearth Lodge, Warren, Ohio, and Niles Lodge, Niles, Ohio, charging the Republic Steel Corpn. with discrimination for union activity in discharge, lay-off and suspension of certain employees.

Conferences on a complaint of employees of the Jones & Laughlin Steel Corpn., Aliquippa, Pa., charging the company with interference with employees in the exercise of collective bargaining rights have been set for Friday and Saturday.

Steel Housing as an Anti-Depression Factor

IN introducing the details of his talk on "Steel in Residence Construction," before the American Welding Society at its afternoon session, Oct. 1, at the Hotel New Yorker, New York, F. T. Llewellyn of the United States Steel Corpn. quoted and disposed of a number of the popular claims and theories which are being put forth supposedly indicative of a quick end to the depression via the mass production and assembly of steel houses.

As to claims of amazingly low costs and consequent low selling prices, Mr. Llewellyn stated that these are best answered by the "Oh, yeah?" slang of today.

Largely because steel does not shrink and therefore permits of accuracy, strength and fits at salient points, the use of unit panels, fabricated at shops for assembly at points where houses are actually under construction, Mr. Llewellyn said, is possibly not a remote probability, although there is little indication of immediate activity and large benefit therefrom. These panels would include certain building details such as doors, windows and other salient building elements, but he warned against too much enthusiasm, at least until a larger degree of standardization of methods is achieved.

It was pointed out that most proposed systems of fabrication and construction have been developed with little thought of the application of steel to the peculiarities of individual preference, and that largely for the purpose of debunking steel house theories of the propaganda type involving much in the way of penned dreams, his company has carried out an extensive survey, as a result of which it has selected three types of houses and construction which may permit of standardized procedure. Covering these three types, it has issued a guidebook for use in working out the problems which must be solved before there can be much accomplished so far as quantity construction is concerned.

For comparative purposes, the speaker showed lantern slides presenting detailed drawings, house elements and houses themselves in various stages of fabrication and construction, both of usable and of quite impossible design.

Welding, Mr. Llewellyn stated, is the most popular method for connecting steel members of steel house units, but he called attention to the fact that a major difficulty confronts those who must deal with the actual field work. This is the difficulty of properly positioning and holding in position for the welding operation the steel uprights, upon the accurate erection of which so much depends in the assembly work.

Interesting facts were shown on the screen in connection with the determination of the costs of finished houses on the basis of ton-weight per room, and it was stated that ultimately even the price of completed houses might be quoted on this basis, after definite data covering a wide range of cost and expense factors has been determined through experience in ascertaining to what extent, if at all, standardized homes will be acceptable to any large numbers of home owners. However, Mr. Llewellyn stressed the fact that whatever may be the final system or systems, the fabrication, selling and erection of steel houses must ultimately be the product of a long-continued period of experience.

Gears & Forgings, Inc., Is Reorganized

GEARS & FORGINGS, INC., Cleveland, has been reorganized as the Ohio Forge & Machine Corpn., the sale of its assets to the latter corporation having been confirmed by the Federal Court in Cleveland. The old company had been in receivership since April 1, 1932. The new company will operate two divisions of Gears & Forgings, Inc., which before their merger in that company were the Ohio Forge Co. and the Van Dorn & Dutton Co. F. H. Chapin, president National Acme Co., Cleveland, will be chairman of the board of the new company and S. C. Dalbey, who was secretary of the old Ohio Forge Co., will be president. Other officers are; vice-president, J. M. Clem, formerly vice-president of the Ohio Forge Co.; Executive vice-president, H. B. Newell, formerly with the Fawcus Machine Co., Pittsburgh and later vice-president in charge of operations of Gears & Forgings, Inc.; secretary and treasurer, T. E. Leighton, formerly with Van Dorn & Dutton Co., and general sales manager, R. B. Tripp, formerly sales manager of the Ohio Forge Co. and later general sales manager of Gears & Forgings, Inc. The two plants, which occupy adjoining sites, will be renovated and new equipment will be installed. The new company will manufacture gears, speed reducers and other power transmission equipment, forgings and special machinery. Sales offices will be maintained in leading cities.

Steel Demand Continues to Show Slow Expansion

Ingot Rate in Further Rise—Scrap Decline Halted—12 Per Cent Loss in Pig Iron Output in September

PIG IRON production in September totaled 898,043 tons, or 29,935 tons per day, compared with 1,054,382 tons, or 34,012 tons daily in August. The loss in terms of daily rate was 12 per cent. The downward trend, however, appears to have been halted. Steel company consumption of hot metal has been increasing moderately of late and the number of active blast furnaces as of Oct. 1—62 stacks—was the same as one month previous.

Further recovery in output is also indicated by late reports from important steel centers. While gains are not so general as a week ago, the national ingot rate has been lifted from 23½ to 24 per cent of capacity. Operations have been risen one point to 16 per cent at Pittsburgh, two points to 20 per cent in the Philadelphia district, and five points to 31 per cent in the Wheeling area. Production in the Cleveland-Lorain area is off three points to 21 per cent and Chicago output has dipped fractionally below last week's rate of 26½ per cent, while operations in other centers remain unchanged.

THE divergent tendencies in different markets apparently signify nothing beyond extreme sensitiveness to fluctuations in demand at a time when forward buying is almost non-existent. With protection against advances during the fourth quarter, consumers see no point in making large commitments, particularly in view of the possibility that existing forms of price control may be radically modified under the reorganized NRA. And many users are cutting more deeply than usual into inventories in their determination to wait out the market. Certain consumers of tin plate are cutting stock material to desired sizes, preferring to take scrap losses rather than to purchase new plate at present prices. Under these conditions current gains in steel bookings probably do not fully measure the depletion of inventories that has taken place since the second quarter. As a result, a potential demand is being built up which may give the market substantial support at a later date.

TRENDS among consuming industries are, on the whole, more favorable. While there is apparently no immediate prospect of a broad renewal of railroad buying, construction activity under Governmental stimulus remains a sustaining market influence, and the automobile outlook has improved. While October will probably be the lowest month of the year in car assemblies, November and December will see a marked rise in output, and as a consequence bookings of automotive steel should show a steady advance during the current month.

Among the smaller consuming groups, the farm equipment, home appliance and stove industries are expanding their operations and taking more material. In the St. Louis district a washing machine manufacturer purchased 1500 tons of pig iron and an agricultural implement plant bought 1000 tons. Despite the season, road machinery makers are still maintaining good shop schedules.

STRUCTURAL steel awards, at 15,850 tons, are more than double those of the previous week. Plate lettings of 4600 tons include 3000 tons for 11 tanks to be built for the Standard Oil Co. of California. The Metropolitan Water District of Southern California will take bids Oct. 31 on the second unit of the Colorado River aqueduct, requiring 30,000 tons of bars, 1200 tons of shapes and 4000 tons of plates. On Oct. 12 the Navy Department will receive tenders on 4400 tons of plates, shapes, bars and strip for five destroyers to be built in Government yards.

THE decline in scrap prices has been halted. Advances at Chicago have offset reductions at Pittsburgh, and THE IRON AGE composite price for heavy melting steel remains unchanged at $9.50 a ton. Heavy exports of scrap from Atlantic, Gulf and Pacific ports continue to draw supplies away from domestic consumers.

A new list of commodity prices applying to forms of cold-rolled strip sold to the automobile industry has been filed with the American Iron and Steel Institute. The new classifications are supplementary to the list of extras now in effect and enable mills rolling strip in narrow widths to compete on more equal terms with sheet mills. The new commodity prices will be effective only during the fourth quarter, as the cold-rolled strip industry is preparing a new card of extras completely reclassifying its products which will probably be ready by the first of next year.

Lake ore shipments in September were 3,439,375 tons, as compared with 4,161,686 tons in the previous month and 5,504,175 tons in September last year. Present indications are that the total movement for the season will not exceed 21,000,000 tons, or somewhat less than last year's total of 21,672,410 tons.

THE IRON AGE composite prices for finished steel and pig iron are unchanged at 2.124c. a lb. and $17.90 a ton respectively.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	Oct. 2, 1934	Sept. 25, 1934	Sept. 5, 1934	Oct. 3, 1933
Per Gross Ton:				
No. 2 fdy., Philadelphia	$20.26	$20.26	$20.26	$18.26
No. 2, Valley furnace	18.50	18.50	18.50	17.50
No. 2 Southern, Cin'ti	19.13	19.13	19.13	18.13
No. 2, Birmingham†	14.50	14.50	14.50	13.50
No. 2 foundry, Chicago*	18.50	18.50	18.50	17.50
Basic, del'd eastern Pa.	19.76	19.76	19.76	17.76
Basic, Valley furnace	18.00	18.00	18.00	17.00
Valley Bessemer, del'd P'gh.	20.76	20.76	20.76	19.76
Malleable, Chicago*	18.50	18.50	18.50	17.50
Malleable, Valley	18.50	18.50	18.50	17.50
L. S. charcoal, Chicago	24.04	24.04	24.04	23.54
Ferromanganese, seab'd carlots	85.00	85.00	85.00	82.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$36.37½	$36.37½	$36.37½	$40.00
Light rails, Pittsburgh	35.00	35.00	35.00	32.00
Rerolling billets, Pittsburgh	27.00	27.00	27.00	26.00
Sheet bars, Pittsburgh	28.00	28.00	28.00	26.00
Slabs, Pittsburgh	27.00	27.00	27.00	26.00
Forging billets, Pittsburgh	32.00	32.00	32.00	31.00
Wire rods, Pittsburgh	38.00	38.00	38.00	35.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.70	1.70	1.70	1.60

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.80	1.80	1.80	1.75
Bars, Chicago	1.85	1.85	1.85	1.80
Bars, Cleveland	1.85	1.85	1.85	1.80
Bars, New York	2.13	2.13	2.13	2.08
Plates, Pittsburgh	1.80	1.80	1.80	1.70
Plates, Chicago	1.85	1.85	1.85	1.75
Plates, New York	2.08	2.08	2.08	1.98
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.70
Structural shapes, Chicago	1.85	1.85	1.85	1.75
Structural shapes, New York	2.05¼	2.05¼	2.05¼	1.95¼
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	1.95
Hot-rolled strips, Pittsburgh	1.85	1.85	1.85	1.75
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.40

Finished Steel

Per Lb.:	Oct. 2, 1934 Cents	Sept. 25, 1934 Cents	Sept. 5, 1934 Cents	Oct. 3, 1933 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.25
Hot-rolled annealed sheets, No. 24, Gary	2.50	2.50	2.50	2.35
Sheets, galv., No. 24, P'gh	3.10	3.10	3.10	2.85
Sheets, galv., No. 24, Gary	3.20	3.20	3.20	2.95
Hot-rolled sheeets, No. 10, P'gh	1.85	1.85	1.85	1.75
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.85
Wire nails, Pittsburgh	2.60	2.60	2.60	2.10
Wire nails, Chicago dist. mill	2.65	2.65	2.65	2.15
Plain wire, Pittsburgh	2.30	2.30	2.30	2.10
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.15
Barbed wire, galv., P'gh	3.00	3.00	3.00	2.60
Barbed wire, galv., Chicago dist. mill	3.05	3.05	3.05	2.65
Tin plate, 100 lb. box., P'gh	$5.25	$5.25	$5.25	$4.65

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$10.25	$10.75	$10.75	$12.75
Heavy melting steel, Phila	9.50	9.50	9.75	10.50
Heavy melting steel, Ch'go	8.75	8.25	8.75	9.62½
Carwheels, Chicago	9.50	9.50	9.50	10.00
Carwheels, Philadelphia	11.25	11.25	11.25	12.25
No. 1 cast, Pittsburgh	11.25	11.75	11.75	11.75
No. 1 cast, Philadelphia	11.75	11.75	11.75	11.50
No. 1 cast, Ch'go (net ton)	8.00	8.00	8.00	10.00
No. 1 RR. wrot., Phila	11.25	11.25	11.25	12.00
No. 1 RR. wrot., Ch'go (net)	7.00	6.75	7.25	8.50

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.85	$3.85	$3.85	$2.50
Foundry coke, prompt	4.60	4.60	4.60	3.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery‡	8.75	8.75	8.75	8.75
Lake copper, New York‡	9.12½	9.12½	9.12½	9.00
Tin (Straits), New York	50.95	51.50	51.55	48.62½
Zinc, East St. Louis	3.90	4.00	4.20	4.75
Zinc, New York	4.25	4.35	4.55	5.12
Lead, St. Louis	3.45	3.50	3.60	4.35
Lead, New York	3.60	3.65	3.75	4.50
Antimony (Asiatic), N. Y.	8.87½	8.75	8.62½	7.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables. ‡Blue Eagle copper.

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▲▲▲ The Iron Age Composite Prices ▲▲▲

	Finished Steel	Pig Iron	Steel Scrap
Oct. 2, 1934	2.124c. a Lb.	$17.90 a Gross Ton	$9.50 a Gross Ton
One week ago	2.124c.	17.90	9.50
One month ago	2.124c.	17.90	9.75
One year ago	2.015c.	16.61	10.96
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1934	2.199c., April 24	2.008c., Jan. 2	$17.90, May 1	$16.90, Jan. 27	$13.00, Mar. 13	$9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., April 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.42, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Output in Further Gain Locally And in Wheeling District

Demand for Finished Steel Continues to Expand Moderately — Scrap Market Settles to Lower Levels

PITTSBURGH, Oct. 2. — Further moderate improvement in demand for finished steel is discernible in the local market. The most encouraging feature of the improvement is the general character of new orders. Demand, moreover, is originating largely in consuming quarters, with jobbers lagging in present activity. The expansion in bookings, however, is very gradual and has not been sufficient to add measurably to rolling schedules. Raw steel output in the Pittsburgh district has crept ahead one point to 16 per cent, while in the Valleys and nearby northern Ohio mills production is holding its own at 26 per cent. Open-hearth engagement in the Wheeling district is up five points to 31 per cent.

Finishing mills are forging ahead of raw steel production. Sheet mills this week will average about 25 per cent, with some units running well above the average. Strip mills are also busier, while tin plate mills continue to set the pace for all departments at a strong 45 per cent. Constructional steel mills continue to feed chiefly on public works specifications, which are characteristically slow in materializing. The Pittsburgh district has not benefited particularly by automotive business but will probably feel the impetus of expected buying by the motor car makers late this month.

The scrap market has settled lower, with prices firm at the new levels.

Pig Iron

Shipments reflect slight improvement, but aggregate tonnage is still discouraging to merchant producers. The foundry trade in this and nearby districts is extremely quiet and is buying only on a hand-to-mouth basis. Basic and Bessemer business has not been of major proportions since early in the year, and no heavy buying for the fourth quarter is believed to be in prospect. Prices in this district have not been affected by lack of demand and remain firm.

Semi-Finished Steel

Most non-integrated mills are assuming the same buying policy as steel consumers in that they are basing purchases largely on early requirements. Hence, backlogs of semi-finished grades have not been swelled measurably at the outset of the fourth quarter. The most sustained movement is in sheet bars, chiefly to detached tin plate mills, and in skelp.

Bolts, Nuts and Rivets

The Navy Department general purchasing office at Washington is inquiring for several hundred tons of bolts, nuts and rivets, in connection with its construction program, on which bids will be opened next week. Otherwise the market remains featureless. There is a slight increase reported in tonnage from miscellaneous sources.

Rails and Track Accessories

Miscellaneous orders for track accessories, largely for maintenance work, have increased. A large part of the rails purchased against the Federal-sponsored program has not yet been laid.

Bars

Most producers report a gradual increase in daily bookings. Aggregate business, however, has not expanded sufficiently to build up mill backlogs. Consequently, bar mill operations continue to be irregular. Consumer demand still is widespread, but there is a complete lack of forward covering. Automotive tonnage shows a trace of improvement.

Reinforcing Steel

A large part of Government specifications for public works calls for rail steel, which is quoted at $3 a ton below billet steel reinforcing. The proportion of awards for rail steel to those for the latter product has consequently been rising. Rail steel has been in particular favor for small post offices. Fresh specifications appearing in the past week were few. The State of Pennsylvania has been allocated $9,590,000 in Federal funds for highway improvement. Approximately one-half of the funds will be used for Federal highways in the state, with a number of the proposed improvements to require the use of reinforced concrete. This program, however, will probably not reach the order stage until next spring.

Cold Finished Steel Bars

Progressive weekly improvement is reported in orders. The impetus for the uptrend is rather general, although in one or two instances automotive tonnage is an important influence. Very little activity is originating from jobbing sources. Jobbers' stocks are evidently still in process of liquidation, and there is no general disposition to replenish inventories when maximum prices are guaranteed for the remainder of the year.

Plates and Shapes

Structural awards in the past week were featured by 2000 tons for an extension to the Internal Revenue Building at Washington, which was placed with Fort Pitt Bridge Works Co. Fourteen hundred tons for the Rundel Memorial Library Building at Rochester, N. Y., which was tentatively awarded some months ago, has definitely been placed with F. L. Heughes & Co. Contracts for state bridge construction continue to predominate the structural market. Inquiries are limited, the only notable item being a Jackson County, Mo., highway bridge, for which 1400 tons will be needed. The plate market is generally lifeless. Revival of an old inquiry of the Ohio River Co., Cincinnati, for a work hull, requiring 200 tons, may result soon in a contract. Railroad construction in this district is at a low ebb and is a poor outlet for plates. Barge yards are only occasionally engaged in repair work and face a continued shortage of activity with the approach of colder weather.

Wire Products

A spurt in miscellaneous orders is reported by some sellers. The general run of business, however, is still so far below normal that mills are not able to speed operations from the recent sluggish pace. Most mills are averaging not more than 20 per cent operations this week. No definite improvement is in evidence in orders from the motor car manufacturers.

Tubular Goods

A moderate demand for oil country goods and stationary pipe accounts for the greatest share of current shipments. Seamless commercial boiler tubes and locomotive tubes are moving in occasional car lots. Jobbers are not particularly important in present activity, although fill-in warehouse orders are adding slightly to weekly mill schedules. Practically no covering for the entire fourth quarter

is reported, with most buying restricted to current actual needs.

Sheets

September tonnage in some cases ran 30 to 40 per cent ahead of August business. The increase was scored largely in the latter half of last month. Current spot buying reflects continued improvement. As a result, most mills have stepped up rolling schedules this week to about 25 per cent. Backlogs, however, are generally very limited, since forward buying is almost wholly lacking. Jobbers are still slow to replenish stocks.

Tin Plate

Miscellaneous demand has shown a surprising spurt, largely owing to heavier consumption in general line cans. An excellent late tomato crop and a heavy pack of lard compounds, the latter growing out of higher cost of pure lard, have contributed to recent specifications. Orders originating at Federal beef-packing centers have fallen off, while export tonnage is not so heavy. There seems to be little doubt that domestic consumption is running well ahead of production, which this week is holding at 45 per cent. In many cases, however, consumers are cutting low-priced tin plate to desired sizes, preferring to take scrap losses than to purchase new tin plate at the present price.

Strip Steel

Miscellaneous orders for hot-rolled and cold-rolled strip have improved. Some tonnage is being received from the automotive industry, presumably for new models, but such business is not yet considered to be significant. Producers are encouraged largely by the general character of incoming tonnage. The recent unsettlement in the cold-rolled strip market has evidently been overcome, and the Pittsburgh base of 2.60c. is firm. Hot-rolled strip remains steady at 1.85c., Pittsburgh.

Coal and Coke

The Chateaugay Ore & Iron Co., Standish, N. Y, has placed its fourth quarter requirements of low phosphorus beehive oven coke, amounting to 15,000 to 20,000 tons. This business had previously been supplied by a by-product producer. Coke production in the Connellsville region is increasing from week to week. The movement of foundry coke continues to be extremely sluggish. The bituminous coal market reflects little improvement. Slack accumulations from screening for domestic sizes are becoming alarmingly heavy, with few industrial consumers interested in tonnage at this time. The Lake movement in September was unusually light, although fairly heavy shipments this month are expected to precede the closing of the navigation season. Prices on coke and coal are unchanged.

Scrap

Prolonged lack of consumer demand has influenced some dealers with accumulations to offer scrap at lower prices. Offers to sell No. 1 heavy melting steel are plentiful at $10.50, with some tonnage in the market at $10.25. Consumer ideas of prices do not coincide with those of dealers. In one case a mill is reported to be seeking to buy No. 1 steel at as low as $10. Dealers, however, in sounding out scrap yards have thus far not been able to find assurance that a $10 order could be profitably covered. Based on present circumstances the No. 1 steel market is quotably lower this week at $10 to $10.50, with corresponding reductions in other major grades. No. 2 steel is quoted at $9 to $9.50, with one broker offering only $8.50 to cover on an order. Compressed sheet steel is down 25c. to $10 to $10.50. At present levels the entire scrap market appears to be more settled than at the higher quotations a week ago. Pennsylvania Railroad and Baltimore & Ohio Railroad tenders will close this week, the former list containing about 21,800 tons, of which 5100 tons is No. 1 steel, and the latter list covering about 7000 tons, of which 1500 tons is No. 1 steel.

Reinforcing Steel

Awards 2250 Tons—New Projects

35,500 Tons

Boston, 150 tons, hospital units, to Concrete Steel Co.

Yonkers, N. Y., 200 tons, sewers, to Truscon Steel Co.

Orleans, Nassau and Cortland Counties, N. Y., 170 tons, mesh for highways, to American Steel & Wire Co.

Nassau County, N. Y., 100 tons, highway, to Truscon Steel Co.

Queens, N. Y., 135 tons, highway, to Kalman Steel Corpn.

Saratoga County, N. Y., 175 tons, mesh for highway, to Kalman Steel Corpn.

Philadelphia, 100 tons, tank foundations for Gulf Refining Co., to Kalman Steel Corpn.

Norfolk, Va., 400 tons, wind tunnel for Navy Department; from J. B. Eurell Co., Philadelphia, general contractor, to Kalman Steel Corpn.

Toledo, 200 tons, Chesapeake & Ohio Railroad docks, to Empire Construction Co., Baltimore.

Decatur, Ill., 110 tons, post office, to an unnamed bidder.

State of Colorado, 178 tons, highway structures in Pueblo and Eagle Counties, to unnamed bidders.

Fallon, Nev., 200 tons, city reservoir, to an unnamed bidder.

Coalinga, Cal., 124 tons, high school science building, to Soule Steel Co.

NEW REINFORCING BAR PROJECTS

New York, 1500 tons, Federal office building; bids to be taken Oct. 24.

Boston, 440 tons, parcel post unit.

Warwick, R. I., 275 tons of mesh and 50 tons of bars for airport.

Trenton, N. J., 480 tons, bids in Oct. 15 for State highway work.

Edge Moor, Del., 300 tons, buildings for Krebs Pigment & Color Co.

Frankfort, Ky., 364 tons, State highway projects, bids Oct. 5 to 8.

Grafton, W. Va., 940 tons, Tygart River Valley reservoir dam; bids to be closed Oct. 15 by the United States Engineer Office, Pittsburgh.

Decatur, Ill., 140 tons for Staley Mfg. Co.

Chicago, 278 tons, Sanitary District work. McKay Engineering & Construction Co., low bidder.

San Francisco, 1100 tons, George Washington school; Meyer Construction Co., low bidder on general contract.

Fort Peck, Mont., 18,000 tons, spillway, Hardwick & McGlone, Kansas City, Mo., low bidders on general contract.

State of Oregon, 111 tons, bridge in Baker and Multnomah Counties; bids Oct. 11.

Los Angeles, 30,000 tons, second unit of Colorado River aqueduct; bids to be taken by Metropolitan Water District of Southern California, Oct. 31.

Southern Market Sluggish

BIRMINGHAM, Oct. 2.—The sluggish condition of the pig iron and steel markets is unchanged. September business was slightly better than that of July or August, but the gain was restricted and has not changed the complexion of prevailing conditions.

The pig iron market is almost entirely dependent on small spot orders. Foundries are still drawing on their stocks or buying only for current requirements. The start of the fourth quarter finds the furnaces with only a small amount of forward tonnage on their books. The price remains at $14.50, base. Furnace operations are unchanged, five stacks being active.

Country demand for sheets and wire products has not materialized to the extent expected, due to the slow marketing of the cotton crop, but it is expected to grow in October.

The Ensley rail mill operated last week for several days. It has closed down again and will remain idle until some new tonnage is booked.

Seven open-hearth units worked last week, an increase of one over the preceding week. The schedule this week is back to six.

Forward Movement Halted In Chicago District

Demand Is Still Exceedingly Conservative—Consumption of Farm Equipment Makers Increases—Steel Scrap Higher

CHICAGO, Oct. 2.—Ingot output is a shade lower as the week starts, but producers are operating conservatively and usually gain a point or so before each week closes. The rate stands now a little above 26 per cent.

New buying of finished steel is far from satisfying and is on a hand-to-mouth basis, which is causing sales costs to mount. Specifications are at the average of the last four weeks, but a shifting of consumers' positions reveals an encouraging, if small, increase in the consumption of farm implement manufacturers, who, by increasing production schedules now, indicate they have more ahead of them than the usual winter manufacturing program. Reports from the drought area show that ample rain is falling, but total crops will be the lowest on record. This situation is well proved by the lack of interest that farmers in that area are showing in their usual fall tasks, which call for wire products and sheets.

The general position of the scrap market has changed materially, with steel mill grades 50c. a ton higher. However, the undertone is still uncertain, as users of most grades find little need either for tonnages on hand or such carloads as they may have on contract.

Pig Iron

A few extra spot purchases and slightly heavier shipments give the measure of this market. Some automobile parts makers are more active and farm equipment builders are definitely expanding their programs.

Reinforcing Bars

A Government housing project for Chicago is again the talk of the trade and from all outward appearances the project is now very much alive and will require a round tonnage of reinforcing bars. Another Government-aid job that is again active is the 4000-ton filter plant to be built at Milwaukee. The current run of business is light, notwithstanding that Illinois has placed sizeable contracts for road work. Last year paving work extended deep into the fall, the weather having been unusually favorable. It is not improbable that much slab work can be done this year before the rules applying to cold weather come into play. Bridge construction in Illinois is usually carried through the winter. Dealers are well satisfied with prices and no complaint is now heard about cutting.

Rails

Both local rail mills remain idle and sellers are very pessimistic concerning the outlook. There is positive proof throughout the entire iron and steel market that railroads are unusually cautious in the matter of purchases of any kind and there is no hint that rails will be an exception. The track accessory movement is small, but that is not a disurbing factor at this time of year. A few carload orders of light rails have been taken.

Wire Products

The sum total of September business showed a very nominal improvement over the August volume and sellers are inclined to the belief that October will step ahead in a meager way. The admission is made on all sides that little is to be expected from the remainder of 1934. Buyers are unusually conservative, regardless of the size of stocks on hand. Their first thought is that they are protected as to price advances during the fourth quarter, and then also they are watching for developments in the reorganization of NRA and the effects they may have on price structures as now set up under the steel code. They believe that a return to a more competitive market may mean lower prices than now prevail. The farmer remains for the most part a spectator rather than an active participant in the wire market. Automobile manufacturers are not taking large quantities but their needs are expected to climb as the fall advances.

Plates

News concerning activity in plates is scattered, but on the whole is somewhat better. Several users in the Southwest have ordered oil tanks that will require 500 tons, and a gas holder and tank covers at Madison, Wis., call for 250 tons. The Illinois Central is not far from placing orders for 11 Diesel locomotives and the Chicago & Illinois Midland may purchase two locomotives. Bids will be opened this week on one of the dams across the Mississippi River. The Fort Peck, Mont., project is marking time pending an award of the general contract to the low bidder.

Structural Material

Drawing rooms are quite barren of new work, but shops still have a fair amount of pending business ahead of them, all things considered. Awards are light, at 1700 tons, and fresh inquiries are for less than 2000 tons. Illinois will open bids Oct. 4 on 750 tons for bridges. It will be two months or more before bids will be taken on the superstructure for the Ashland Avenue bridge, Chicago, the substructure for which has been placed.

Bars

Expectations of a week ago that bar demand would increase have not been fulfilled and shipments have fallen back to the average of the last four to five weeks. So far as the automobile industry is concerned changes in demand can come suddenly. Some parts suppliers are getting under way, but their needs as yet are small. Viewing all industries from the angle of growing use of steel bars, there is no doubt but that at the moment the farm implement group is leading the procession. The road machinery industry is still enjoying good shop schedules.

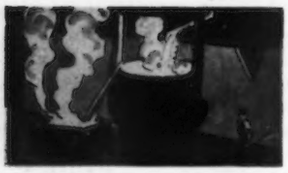
Coke

Foundry coke is pegged at $8.50 a ton, Chicago ovens, for the month of October. Shipments are moderately higher, principally on account of a heavier melt by farm implement manufacturers.

Scrap

This market has done an about face, but it is having difficulty in holding its position. One steel mill has purchased over 25,000 tons of scrap, paying $9 a ton for the heavy melting and $8.25 for hydraulic sheets. Another mill has taken a small lot of heavy melting steel at $9 and brokers are paying that figure to cover. In spite of this situation and the fact that open-hearth output is moderately better, there is no disposition on the part of large consumers to increase their acceptances. When one looks for heavier shipments he must turn to the agricultural implement group, which is slowly making headway. The Rock Island and the Milwaukee Road are offering large lists, each containing about 35 cars of heavy melting steel. Foreign buying is of no importance in this market except that it is drawing supplies away from St. Louis for shipment to Gulf ports.

Steel Orders Increase in Number at New York



Cautious Buying for Stock Replenishment Is Indicated — Oil Companies Buying More Freely — Large Structural Jobs Before the Trade

NEW YORK, Oct. 2.—Taken as a whole, steel bookings in September appear to have exceeded those of August by a small margin. Commitments in the heavier products ranged from 15 to 20 per cent larger than those of August, while orders for the lighter rolled products showed a moderate decline. The most encouraging aspect of the market is an increase in the number of orders, which suggests that a growing number of buyers are finding it necessary to fill in holes in their stocks. The attitude of consumers, however, is still hesitant, no doubt reflecting the uncertainty that always attends a period immediately preceding a national election.

Oil companies are showing greater interest in storage tanks for both domestic and foreign locations. Several fair-sized tanks have been placed and a considerable number are pending. One oil company has ordered two tankers and another has asked for quotations on high-tensile steel for tanker repairs.

Construction activity, most of it financed with Government money, is proving one of the mainstays of the market in this district. Awards, subject to final approval of a Federal loan, have been made in connection with Hudson River pier shed No. 32, New York. Erection of the steel, amounting to 3400 tons, has been placed with the Taylor-Fichter Structural Steel Co. and the fabricating will be done by the Jones & Laughlin Steel Corpn. The taking of bids on the New York Federal building, which according to the latest estimates will take 18,000 tons of structural steel, 1500 tons of reinforcing bars and 500 to 1000 tons of sheet piling, has been postponed from Oct. 2 to Oct. 24. Similarly, the receipt of tenders on the new Boston post office, 8000 tons, has been postponed from Oct. 2 to Oct. 24. The plans and specifications for the New York approach for the Midtown tunnel under the Hudson River are virtually completed and the job will probably be advertised for bids this month.

Pig Iron

A large proportion of current orders is for reasonably nearby shipment, and the trade therefore believes that weekly sales indicate that general foundry business is better than a month ago. Total bookings for the past seven-day period amounted to 1400 tons, as compared with 1650 tons a week earlier and 2000 tons sold a fortnight ago. There is slightly more inquiry in the market, and trade opinion is that foundry demand will improve during the next month as stocks reach the replenishment stage. The protracted period of light buying throughout this territory has resulted in the accumulation of heavy stocks at some furnaces. Because of this it is reported that a Buffalo furnace and the Troy stack may soon be banked. An ore importer is reported to be offering Russian pig iron to users here. So far no actual sales are known to have been made, and it is the opinion of some sellers that the NRA regulation requiring domestic iron for steel to be used in Federal financed projects will seriously handicap the selling of this iron.

Reinforcing Steel

Prices are very steady in this territory, and there is a fair amount of tonnage being purchased. All bids were uniform on the 1000 tons of bars for the Department of Parks, New York, and no disposition of the material has yet been made. The state of Rhode Island is purchasing 1000 tons in odd lots as needed for an underpass at Cumberland, and New York State has awarded approximately 600 tons of mesh and bars to various distributers to be used for miscellaneous highway projects. In addition about 200 tons was awarded to Truscon Steel Co. for sewers at Yonkers, N. Y. Pending business is fairly light, the largest tonnage being an aggregate of 480 tons for New Jersey highways which will be awarded Oct. 15.

Scrap

Local brokers are finding it difficult to secure heavy melting steel in desirable quantities for export at the quoted price levels. Two boats are now loading No. 1 and No. 2 steels for England and the Continent, and bids higher than $8 and $6.50 respectively have been made for these materials in several cases where barge lots were available. The general broker attitude, however, is to make as few attempts as possible to accelerate the flow of scrap by raising quotations. This follows from the fact that dealers themselves are not obtaining sufficient quantities of certain grades from scrap sources. Therefore a price rise would not necessarily result in heavier scrap deliveries. Cast grades likewise are not plentiful either for domestic delivery or for pending foreign orders. It is evident from the above that the market undertone on more important grades is improving. Significant price advances may be expected if post-election demands are as encouraging as several brokers anticipate.

Pig Iron Buying Gains at St. Louis

ST. LOUIS, Oct. 2.—The melt of pig iron is on the increase among nearly all classes of users except the steel mills. Especially is this true in the home appliance, farm implement and stove industries. A washing machine manufacturer has closed on an inquiry for 1500 tons of Southern iron, most of which is understood to have been purchased. A central Illinois implement company has bought 1000 tons of Southern iron. Stove plants, which had slowed down during July and August, are now busy working on orders for mail order houses and other large buyers for delivery during this and next month. Jobbing foundries also are showing marked improvement in operations.

No sales of consequence have been made by scrap dealers, but it is reported that a district mill has been inquiring for miscellaneous rails. Prices are unchanged. The Missouri-Kansas-Texas Railway has a list of 2000 tons of specialties.

The daily average of business done by warehouses is reported to have been higher during September than during August, but with fewer working days total volume was slightly less than in the preceding month.

The State of Missouri has awarded 350 tons of plates for automobile license tags to the Sheffield Steel Corpn.

Tenders Asked On Coast Aqueduct

LOS ANGELES, Oct. 2.—The Metropolitan Water District of Southern California will receive bids here Oct. 31 for the construction of the second unit of the Colorado River aqueduct. The 30-mile section of the aqueduct, to be constructed between a point northwest of Indio, Cal., and Riverside, Cal., will include concrete and steel siphons and appurtenant work. Steel tonnage estimates, under specification No. 75, include approximately 30,000 tons of bars, 1200 tons of shapes and 4000 tons of plates.

Improvement In Steel Orders Continues at Philadelphia

Ingot Rate Advanced to 20 Per Cent of Capacity—Navy Department Inquiry Before Trade—Pig Iron Output Increased

PHILADELPHIA, Oct. 2.—The improvement in finished steel orders which was first noticed in this district about the middle of September is continuing. Business is still confined to very small lots, but the number of inquiries is increasing steadily and practically all of the steel being taken out is going immediately into consumption. Most of the demand is coming from manufacturing consumers, as warehouse stocks do not appear to have been exhausted.

Steel ingot output in the district has again risen two points and now stands at 20 per cent of capacity. The leading interest has accounted for the entire gain, as an independent company has taken off its only active open-hearth unit and does not expect to resume steel production for about two weeks. A blast furnace has resumed production.

Railroad activity is still confined principally to anticipation. The Pennsylvania has not yet acted upon the bids which it opened last week, and may not place contracts for the steel which it will require during the quarter. The Baltimore & Ohio has an extensive repair program which will benefit mills in the Philadelphia district, but is slow to make the purchases required. The Reading and the Central of New Jersey are said to be considering winter shop activity in order to keep their employees busy, but actual steel requirements cannot be gaged.

The Navy Department will take bids Oct. 12 on 4400 tons of plates, sheets, bars and strip steel for the construction of five destroyers in its yards at Boston, Norfolk, Va., Puget Sound, Wash., and Mare Island, Cal. It is still delaying releases on much of the steel required for ships already under construction.

The Delaware River Joint Commission has issued plans for 5.36 miles of single track for the high-speed subway approach for the Philadelphia-Camden bridge.

Pig Iron

September shipments showed an appreciable gain over August totals, but were far below the average for the year. Foundry melt in the district seems to be slightly heavier, with stove foundries notably active, comparatively speaking. Large buyers are showing no interest in the market. Sellers in the district are not particularly disturbed by solicitation of orders for Soviet iron in this territory. While a price concession will likely be available, foundries are slow to change their melting habits and most of them are also well supplied with iron. They are also unable to use foreign iron in the filling of PWA orders.

Bars, Plates and Shapes

The Krebs Pigment & Color Co., a duPont interest, has taken bids on approximately 2800 tons of shapes and 300 tons of reinforcing bars for the construction of several manufacturing buildings at Edgemoor, Del. This is the largest private job that has come out in the vicinity for some time. The market is quiet otherwise, with the Navy Department's inquiry for 4400 tons of plates, bars, sheets and strip occupying the center of attention. About half this material will be used at Boston and Norfolk, Va., while the rest will go to the Pacific Coast. Railroad orders are light, but business is expected this month or next from the Baltimore & Ohio, the Reading and the Central of New Jersey. The Pennsylvania has not yet taken action on the Clayton Act bids which it opened last week. Reinforcing bars are relatively more active than structural steel, as highway construction is about the only PWA activity in this territory. The Delaware Highway Department will take bids Oct. 3 on 680 tons of sheet steel piling.

Sheets

With orders from radio and stove manufacturers well sustained, demand for sheet steel is a little stronger. Warehouses, however, are not buying and their stocks seem ample to meet the current light demand. Automobile body plants are said to be considering rather extensive purchases and one of them may stock steel in anticipation of inflation.

Warehouse Business

Sales of steel out of warehouse during September showed an improvement over August, but were not sufficient to make an appreciable dent in stocks. Small manufacturers are not busy and are buying only for their immediate needs.

Imports

The following iron and steel imports were received here last week: 4062 tons of pig iron from the Netherlands, 30 tons of ferromanganese from Norway, and 21 tons of steel tubes and 2 tons of steel forgings from Sweden.

Scrap

Mill purchases have been lacking in the last week, but dealers are still buying scrap regularly for export at $9.25 for No. 1 heavy melting steel. It is unlikely that domestic purchases could be made at less than $9.50 and higher prices would be asked on substantial tonnages. Railroad specialties and low phosphorus scrap are quotably lower in sympathy with heavy melting steel.

Large Scrap Purchases At Buffalo

BUFFALO, Oct. 2.—Either because of inroads on scrap piles by the operations of early summer or on account of the gradual impoverishment of this area by shipments for export, the local scrap market has experienced a buying flurry. Some of these transactions took place during the past week, and at least one is an older transaction just coming to light.

The principal consumer picked up about 3000 tons of miscellaneous material, including some No. 1 heavy melting steel, at $9.50 and some old bundles at around $6.50 or $7. Another mill purchased 3000 tons of No. 1 and No. 2 heavy melting steel at $9.75 and $8.75. An older transaction was 2000 tons of No. 2 heavy melting at about $8.75 or $9. Smaller sales of blast furnace scrap (short mixed turnings and borings) were made at prices ranging from $5.75 to $6; sales of stove plate brought $8.75; No. 1 machinery cast to a radiator plant for a frontier point was purchased at $10.75.

A new all-rail rate of $2.70 from Syracuse and points east on scrap for export is attracting material from a territory that would ordinarily flow to Buffalo. The rate from Utica to Buffalo, for instance, is $3.15. This situation in export scrap is impeding accumulation of scrap here.

Operations of local steel mills are the same as last week. Lettings of structural and reinforcing steel are meager. A school at Endicott, N. Y., required 100 tons of fabricated structural steel.

Sales of pig iron are limited to carload lots, with now and then a two or three-car lot. Foundry melt is better than in June, but is still uncertain.

Cleveland Rate Drops Back to 21 Per Cent

But Finished Steel Demand Shows Another Moderate Gain—Ore Shipments Likely to Fall Behind Last Year's

CLEVELAND, Oct. 2.—Demand for finished steel showed another moderate gain the past week. This was due largely to additional releases by the motor car industry, which placed some tonnage in sheets and strip steel for new models in addition to orders for filling in stocks. Miscellaneous orders for bars, plates and shapes also increased. This gain appears to be due to depletion of consumers' stocks. Mills took several orders for structural shapes for Ohio highway bridge work recently awarded to fabricators.

Ingot output in the Cleveland-Lorain territory this week dropped back three points, losing the gain it had made the previous week. There was some increase in finishing mill operations this week due to the accumulation of orders. Generally business in metal-working industries shows little, if any, up trend. Plants showing the most life outside of the automotive industry are those manufacturing stoves, refrigerators and other consumer goods.

Activity in the construction field is still limited to public work. Bids will be asked for shortly for the first work in connection with the Muskingum Valley flood control project, which will take a large tonnage of steel, but which will be extended over a long delivery period.

With some ore firms about through with shipments, the movement of Lake Superior ore will be very light during the remainder of the season and total shipments are likely to be less than last year.

Pig Iron

Orders continue to increase in number, but not in size. Consumers are buying only for prompt shipment, preferring to purchase small lots often, rather than to make commitments for larger quantities to carry them over for more extended periods. Few, if any, consumers have placed fourth quarter contracts. Little change is reported in foundry operations.

Iron Ore

The movement of ore from Lake Superior district is declining rather sharply and present indications are that the total shipments for the season will not exceed 21,000,000 tons, or somewhat less than last year, when water and all-rail shipments aggregated 21,672,410 tons. September shipments were 3,439,375 tons, as compared with 4,161,686 tons in August and with 5,504,175 tons in September last year. The total movement until Oct. 1 was 19,125,586 tons, as compared with 16,301,573 tons during the same period last year. While this is a gain of 17.32 per cent over the same period a year ago, this excess probably will be more than offset, owing to greatly reduced shipments during the remainder of the season of navigation.

Sheets

Improvement in the demand reported a week ago is being maintained. Mills in this territory during the week received some new orders from Michigan automobile companies for moderate-sized lots, mostly for fill-in purposes, although some of the material was for 1935 models. Releases continue to come from refrigerator and stove manufacturers. The local continuous mill will be started up in the latter part of the week.

Strip Steel

Substantial orders for both hot and cold-rolled strip came from General Motors plants during the week for Chevrolet parts, supplementing purchases made by these plants during the previous week and covering shipping requirements through October. There was also some new business from other automotive sources. New demand outside of the motor car field continues light.

Bolts and Nuts

The volume of business in September was disappointing, but manufacturers look for some improvement this month. Jobbers have commenced to buy in a limited way, orders from this source perhaps being stimulated by the recent price reduction. Not much business is coming from the automotive industry.

Bars, Plates and Shapes

Awards of 1250 tons have been made by the Chesapeake & Ohio Railroad for dock improvements in Toledo. These include a car dumper, taking 800 tons of shapes and 250 tons of steel piling, and 200 tons of reinforcing bars for dock extensions. The Ohio highway department has issued a new list of projects, but these require very little steel. The War Department is expected to take bids about Nov. 15 for three dams for the Muskingum Valley flood control project, for which specifications will be out shortly. These will take about 1200 tons of reinforcing bars.

Scrap

Some new releases of heavy melting steel have come from the Youngstown district and the market shows a slightly firmer tone. Dealers are reported to be paying up to $10.25 for No. 1 heavy melting steel for Youngstown delivery, as compared with a ruling price of $10 a week ago. There is no local demand for either steel or blast furnace grades.

Boston Scrap Exports Held Up Temporarily

BOSTON, Oct. 2.—Local and Providence, R. I., exports of scrap have been held up temporarily because of the inability of shippers to obtain steamers. One Boston firm has covered on 4000 tons of scrap for export, and Providence interests have about 2500 tons on dock waiting ocean space. Any weakness in Pittsburgh district No. 1 heavy melting steel quotations is not reflected here owing to the lack of orders for delivery there. In fact, the local scrap market, aside from export buying, is at a standstill, and prices, with one exception, are nominal. Dye makers are still holding up shipping instructions on chemical borings because of the uncertainty of the textile labor situation. The only outlet for such borings today is for gas house use, and such consumers will not pay more than $6 to $7 a ton on cars shipping point.

The pig iron market continues in the doldrums, with no indication when things will be better. The New England melt of iron is still 10 to 15 per cent of rated capacity.

Few sizable reinforcing bar tonnages are coming on the market, but there is a very good business in small lots. The fabricated structural steel market has improved, but is by no means active.

An order for 21 recording and integrating steam flow meters with auxiliary pressure records has been received by the Bailey Meter Co., Cleveland, from its Canadian subsidiary, the Bailey Meter Co., Ltd. Installation is to be in the Imperial Refineries, Ltd., Sarnia, Ontario, Canada.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

	Soft Steel	*Base per Lb.*
F.o.b. Pittsburgh		1.80c.
F.o.b. Chicago		1.85c.
F.o.b. Gary		1.85c.
F.o.b. Duluth		1.95c.
Del'd Detroit		1.95c.
F.o.b. Cleveland		1.85c.
F.o.b. Buffalo		1.90c.
Del'd Philadelphia		2.09c.
Del'd New York		2.13c.
F.o.b. Birmingham		1.95c.
F.o.b. cars dock Gulf ports		2.20c.
F.o.b. cars dock Pacific ports		2.35c.

Rail Steel
(For merchant trade)

F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Gary	1.75c.
F.o.b. Moline, Ill.	1.75c.
F.o.b. Cleveland	1.75c.
F.o.b. Buffalo	1.80c.
F.o.b. Birmingham	1.85c.
F.o.b. cars dock Gulf ports	2.10c.
F.o.b. cars dock Pacific ports	2.25c.

Billet Steel Reinforcing
(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.05c.
F.o.b. Chicago	2.10c.
F.o.b. Gary	2.10c.
Del'd Detroit	2.20c.
F.o.b. Cleveland	2.10c.
F.o.b. Youngstown	2.10c.
F.o.b. Buffalo	2.10c.
F.o.b. Birmingham	2.10c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Rail Steel Reinforcing
(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago	1.95c.
F.o.b. Gary	1.95c.
F.o.b. Cleveland	1.95c.
F.o.b. Youngstown	1.95c.
F.o.b. Buffalo	1.95c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.30c.

Iron

F.o.b. Chicago	1.80c.
F.o.b. Terre Haute, Ind.	1.75c.
F.o.b. Louisville, Ky.	2.10c.
F.o.b. Danville, Pa.	1.80c.
F.o.b. Berwick, Pa.	1.80c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	2.10c.
F.o.b. Chicago	2.15c.
F.o.b. Gary	2.15c.
F.o.b. Cleveland	2.15c.
F.o.b. Buffalo	2.20c.
Del'd Detroit	2.30c.
Del'd eastern Michigan	2.35c.

* In quantities of 10,000 to 19,000 lb.

Fence and Sign Posts

	Angle Line Posts *Base per Net Ton*
F.o.b. Pittsburgh	$50.00
F.o.b. Chicago	50.00
F.o.b. Duluth	51.00
F.o.b. Cleveland	50.00
F.o.b. Birmingham	53.00
F.o.b. Houston	59.00
F.o.b. cars dock Pacific ports	68.00

Plates

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
Del'd Cleveland	1.985c.
F.o.b. Coatesville	1.90c.
F.o.b. Sparrows Point	1.90c.
Del'd Philadelphia	1.985c.
Del'd New York	2.08c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.
Wrought iron plates, f.o.b. P'gh	3.00c.

Floor Plates

F.o.b. Pittsburgh	3.35c.
F.o.b. Chicago	3.40c.
F.o.b. Coatesville	3.45c.
F.o.b. cars dock Gulf ports	3.75c.
F.o.b. cars dock Pacific ports	3.90c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
Del'd Cleveland	1.985c.
F.o.b. Buffalo	1.90c.
F.o.b. Bethlehem	1.90c.
Del'd Philadelphia	2.065c.
Del'd New York	2.0525c.
F.o.b. Birmingham (standard)	1.95c.
F.o.b. cars dock Gulf ports	2.25c.
F.o.b. cars dock Pacific ports	2.35c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.15c.
F.o.b. Chicago	2.25c.
F.o.b. Buffalo	2.25c.
F.o.b. cars dock Gulf ports	2.60c.
F.o.b. cars dock Pacific ports	2.60c.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.85c.
No. 10, f.o.b. Gary	1.95c.
No. 10, del'd Detroit	2.05c.
No. 10, del'd Phila.	2.14c.
No. 10, f.o.b. Birmingham	2.00c.
No. 10, f.o.b. dock cars Pacific ports	2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Gary	2.50c.
No. 24, del'd Detroit	2.60c.
No. 24, del'd Phila.	2.69c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, f.o.b. dock cars Pacific ports	3.05c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c.
No. 10 gage, f.o.b. Gary	2.60c.
No. 10 gage, del'd Detroit	2.70c.
No. 10 gage, del'd Phila.	2.79c.
No. 10 gage, f.o.b. Birmingham	2.55c.
No. 10 gage, f.o.b. dock cars Pacific ports	3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Gary	3.05c.
No. 20 gage, del'd Detroit	3.15c.
No. 20 gage, del'd Phila.	3.24c.
No. 26 gage, f.o.b. Birmingham	3.10c.
No. 20 gage, f.o.b. dock cars Pacific ports	3.50c.

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	3.10c.
No. 24, f.o.b. Gary	3.20c.
No. 24, del'd Phila.	3.39c.
No. 24, f.o.b. Birmingham	3.25c.
No. 24, f.o.b. dock cars Pacific ports	3.70c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	3.40c.
F.o.b. cars dock Pacific ports	4.10c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c.
No. 28, Gary	2.85c.
No. 28, cars dock, Pacific Coast ports	3.35c.

Tin Plate *Base per Box*

Standard cokes, f.o.b. P'gh district mill	$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate
(F.o.b. Pittsburgh)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Stripe and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., P'gh	1.85c.
All widths up to 24 in., Chicago	1.95c.
All widths up to 24 in., del'd Detroit	2.05c.
All widths up to 24 in., Birmingham	2.00c.
Cooperage stock, Pittsburgh	2.10c.
Cooperage stock, Chicago	2.20c.

Cold-Rolled Strips

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.88c.
F.o.b. Worcester	2.80c.

Fender Stock

No. 16 and heavier, Pittsburgh or Cleveland	3.15c.
F.o.b. Worcester	3.55c.
No. 17 and lighter, Pittsburgh or Cleveland	3.30c.
F.o.b. Worcester	3.70c.

Hot-Rolled Rail Steel Strips

	Base per Lb.
F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Birmingham	1.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

	To Manufacturing Trade *Per Lb.*
Bright wire	2.30c.
Spring wire	3.20c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland.

To Jobbing Trade

Qualified jobbers are entitled to a reduction of 20c. a 100 lb. from the base price on carload shipments to stock, and of 10c. a 100 lb. on less-carload shipments to stock.

	Base per Keg
Standard wire nails	$2.60
Smooth coated nails	2.60
Galvanized nails:	
15 gage and coarser	4.60
16 gage and finer	5.10

	Base per 100 Lb.
Annealed fence wire	$2.45
Galvanized fence wire	2.80
Polished staples	3.30
Galvanized staples	3.55
Barbed wire, galvanized	3.00
Woven wire fence, base column	3.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are $2 a ton over Pittsburgh (except for woven wire fence at Duluth which is $3 over Pittsburgh), and Birmingham mill prices are $3 a ton over Pittsburgh.

On manufacturers' wire prices at Pacific ports are $9 above the Pittsburgh base. On high-carbon spring wire, prices at Pacific ports are also $9 above Pittsburgh. On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi are $6 a ton over Pittsburgh, while New Orleans and Pacific Coast prices are $8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are $11 a ton above Pittsburgh.

Wire Hoops, Twisted or Welded

	Off List
F.o.b. Pittsburgh	35 and 2½ off
F.o.b. Chicago	35 off

Bale Ties, Single Loop

	Base per Net Ton
F.o.b. Pittsburgh	$63.00
F.o.b. Chicago	64.00
F.o.b. Duluth	65.00
F.o.b. Cleveland	63.00
F.o.b. Birmingham	66.00
F.o.b. cars dock Houston, Galveston, Beaumont, Orange or Corpus Christi, Tex.	72.00
F.o.b. cars dock Pacific ports	74.00

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel Inches	Steel Black	Steel Galv.	Wrought Iron Inches	Wrought Iron Black	Wrought Iron Galv.
⅛	51½	29½	⅛	+9	+13½
¼ to ⅜	53½	33	¼ & ⅜	+1½	+21½
½	58½	47	½	31½	15
¾	62	52	¾	36½	20½
1 to 3	64	55	1 & 1¼	39½	25½
			1½	43½	28
			2	41½	26

Lap Weld

2	60	51	2	37	22½
2½ to 3	63	54	2½ to 3½	38	25
3½ to 6	65	56	4 to 8	40	28½
7 and 8	64	54	9 to 12	38	24½
9 and 10	63½	53½			
11 and 12	62½	52½			

Butt Weld, extra strong, plain ends

⅛	48½	33½	⅛	+13	+45½
¼ to ⅜	51	38	¼ & ⅜	+2½	+34½
½	56½	47½	½	32½	17½
¾	61	52	¾	37½	22½
1 to 3	63	55	1 to 2	43½	29

Lap Weld, extra strong, plain ends

2	58	50	2	40	26
2½ to 3	62	54	2½ to 4	45½	33
3½ to 6	65½	57½	4½ to 6	45	33½
7 and 8	64½	54½	7 & 8	46	33
9 and 10	63½	53½	9 to 12	41½	30
11 and 12	62½	52½			

On standard steel pipe an extra 5% off is allowed on sales to consumers while two 5's off apply on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 22½ and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5's off are allowed to consumers and three 5's off to jobbers.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 8.60	$7.82
1¼ in. o.d.	13 B.W.G.	10.19	9.26
1½ in. o.d.	13 B.W.G.	11.26	10.23
1¾ in. o.d.	13 B.W.G.	12.81	11.64
2 in. o.d.	13 B.W.G.	14.35	13.04
2¼ in. o.d.	13 B.W.G.	16.00	14.54
2½ in. o.d.	12 B.W.G.	19.29	17.54
2¾ in. o.d.	12 B.W.G.	20.45	18.59
3 in. o.d.	12 B.W.G.	21.45	19.50
3¼ in. o.d.	11 B.W.G.	25.22	22.93
3½ in. o.d.	11 B.W.G.	27.09	24.62
4 in. o.d.	10 B.W.G.	33.60	30.54
4½ in. o.d.	10 B.W.G.	41.08	37.35
5 in. o.d.	9 B.W.G.	51.56	46.87
6 in. o.d.	7 B.W.G.	79.15	71.96

Extras for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
10,000 lb. or ft. to 24,999 lb. or ft.	12½ %
2,000 lb. or ft. to 9,999 lb. or ft.	25 %
Under 2,000 lb. or ft.	40 %

Hot-Finished Lapweld Steel Pressure Tubes

(Net base prices per 100 ft., f.o.b. Pittsburgh, in carload lots)

1½ in. o.d. 13 B.W.G.	$ 9.72
1¾ in. o.d. 13 B.W.G.	11.06
2 in. o.d. 13 B.W.G.	12.38
2¼ in. o.d. 13 B.W.G.	13.79
2½ in. o.d. 12 B.W.G.	16.58
2¾ in. o.d. 12 B.W.G.	17.54
3 in. o.d. 12 B.W.G.	18.35
3¼ in. o.d. 11 B.W.G.	21.56
3½ in. o.d. 11 B.W.G.	23.15
4 in. o.d. 10 B.W.G.	28.66
4½ in. o.d. 10 B.W.G.	35.22
5 in. o.d. 9 B.W.G.	44.25
6 in. o.d. 7 B.W.G.	68.14

Quantity Extras:

40,000 lb. or ft.	base
25,000 lb. or ft. to 39,999 lb. or ft.	plus 5 %
10,000 lb. or ft. to 24,999 lb. or ft.	plus 12½ %
2,000 lb. or ft. to 9,999 lb. or ft.	plus 25 %
Under 2,000 lb. or ft.	plus 40 %

CHARCOAL IRON BOILER TUBES

Base Discounts, f.o.b. Pittsburgh

In. O. D.	
1½ and 1¾	44
2 —2½	13 and 10
2½—2¾	16 and 10
3	17 and 10
3¼—3½	18 and 10
4	20 and 10
4½, 5, 6	21 and 10

Extras for quantity: For 1½ to 1¾, up 8 points under 10,000 lb., up 4 points 10,000 lb. to carload. For 2 in. to 5⅝ in., up 2 points without supplementary 10 per cent, under 10,000 lb.; supplementary 5 per cent instead of supplementary 10 per cent for 10,000 lb. to carload.

In sizes 2 in. to 4½ in. O.D. inclusive, all tubes more than four gages heavier than standard are priced per lb. as follows: Carload and over, 9c.; extras for quantity—under 10,000 lb. 1c. per lb., 10,000 lb. to carload ½c. per lb.

CAST IRON WATER PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	$47.00
4-in., del'd Chicago	50.00
6-in. and larger, del'd New York	45.00
4-in. del'd New York	48.00
6-in., and larger, Birmingham	39.00
4-in. Birmingham	42.00

Class "A" and gas pipe, $3 extra

RAILROAD MATERIALS

Rails and Track Supplies

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$36.37½
Angle bars, per 100 lb.	2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	$35.00
Light rails (from rail steel) per gross ton	34.00

	Base per 100 Lb.
Spikes, 9/16 in. and larger	$2.40
Spikes, ½ in. and smaller	2.40
Spikes, boat and barge	2.40
Tie plates, steel	1.90
Track bolts, to steam railroads	3.55
Track bolts, no jobbers, all sizes (per 100 count)	70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va., Jersey City, N. J.

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine bolts	70, 10 and 10
Carriage bolts	70, 10 and 10
Lag bolts	70, 10 and 10
Plow bolts, Nos. 1, 2, 3 and 7 heads	70, 10 and 10
Hot-pressed nuts, blank or tapped, square	70, 10 and 10
Hot-pressed nuts, blank or tapped, hexagons	70, 10 and 10
C.p.c. and t. square or hex. nuts, blank or tapped	70, 10 and 10
Semi-finished hexagon nuts U.S.S. all sizes	70, 10 and 10
Semi-finished hexagon nuts, S.A.E.	
¼ in. to 7 1/16 in. diameter	75 and 10
½ in. to 1 in. diameter	75
larger than 1 in. diameter	70
Stove bolts in packages, Pittsburgh	75
Stove bolts in packages, Chicago	75
Stove bolts in packages, Cleveland	75
Stove bolts in bulk, P'gh	83
Stove bolts in bulk, Chicago	83
Stove bolts in bulk, Cleveland	83
Tire bolts	60 and 10

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00
F.o.b. Birmingham	3.05

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 5
F.o.b. Cleveland	70 and 5
F.o.b. Chicago and Birm'g'm	70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	75, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread ⅜ in. and smaller	75
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	85
Upset set screws, cut and oval point	75 and 10
Milled studs	65

Alloy and Stainless Steel

Alloy Steel Ingots

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Uncropped.....$40 per gross ton

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $49 a gross ton.
Price del'd Detroit is $52.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base.....2.45c.
Delivered price at Detroit is.....2.60c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (1½% Nickel)	$0.25
2100 (2½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.

STAINLESS STEEL No. 302

(17 to 19% Cr, 7 to 9% Ni, 0.08 to 0.20% C)

(Base Prices, f.o.b. Pittsburgh)

	Per Lb.
Bars	23c.
Plates	26c.
Sheets	33c.
Hot-rolled strip	20¾c.
Cold-rolled strip	27c.

Raw and Semi-Finished Steel

Carbon Steel Rerolling Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Uncropped.....$29 per gross ton

Carbon Steel Forging Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Birmingham.
Uncropped.....$31 per gross ton

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.

	Per Gross Ton
Rerolling	$27.00
Forging quality	32.00
Delivered Detroit	
Rerolling	$30.00
Forging	35.00
Billets Only F.o.b. Duluth	
Rerolling	$29.00
Forging	34.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$28.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved	1.70c.
Universal	1.70c.
Sheared	1.70c.

Tube Rounds

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
F.o.b. Birmingham	1.95c.

Wire Rods

(Common soft, base)

	Per Gross Ton
F.o.b. Pittsburgh	$38.00
F.o.b. Cleveland	38.00
F.o.b. Chicago	39.00
F.o.b. Anderson, Ind.	39.00
F.o.b. Youngstown	39.00
F.o.b. Worcester, Mass.	40.00
F.o.b. Birmingham	41.00
F.o.b. San Francisco	47.00

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	$19.50	$20.00	$19.00	$20.50
Bethlehem, Pa.	19.50	20.00	19.00	20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Steelton, Pa.	....	....	19.00	....
Sparrows Point, Md.	19.50	....	19.00	....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown	18.50	18.50	18.00	19.00
Buffalo	18.50	19.00	17.50	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, Ohio	18.50	18.50	18.00	19.00
Jackson, Ohio	20.25	20.25	19.75	....
Detroit	18.50	18.50	18.00	19.00
Hamilton, Ohio	18.50	18.50	18.00	19.00
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	18.50	18.00	....
Duluth, Minn.	19.00	19.00	....	19.50
Birmingham	14.50	14.50	13.50	19.00
Provo, Utah	17.50	....	....	....

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District				
From Everett, Mass.	$20.00	$20.50	$19.50	$21.00
Brooklyn				
From East Pa. or Buffalo	21.77	22.27	21.27	22.77
Newark or Jersey City, N. J.				
From East. Pa. or Buffalo	20.89	21.39	20.39	21.89
Philadelphia				
From Eastern Pa.	20.26	20.76	19.76	21.26
Cincinnati				
From Hamilton, Ohio	19.51	19.51	19.01	20.01
Canton, Ohio				
From Cleveland and Youngstown	19.76	19.76	19.26	20.26
Columbus, Ohio				
From Hamilton, Ohio	20.50	20.50	....	....
Mansfield, Ohio				
From Cleveland and Toledo	20.26	20.26	....	....
Indianapolis				
From Hamilton, Ohio	20.77	20.77	....	....
South Bend, Ind.				
From Chicago	20.55	20.55	....	....
Milwaukee				
From Chicago	19.50	19.50	....	....
St. Paul				
From Duluth	20.94	....	....	....
Davenport, Iowa				
From Chicago	20.26	20.26	....	....
Kansas City				
From Granite City	21.04	21.04	....	....

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.....$23.50
Johnson City, Tenn. 23.50
Del'd Chicago 29.15
Johnson City, Tenn. (off grade).. 19.50

GRAY FORGE PIG IRON

Valley furnace $18.25

CHARCOAL PIG IRON

Lake Superior furnace $21.00
Delivered Chicago 24.04
Delivered Buffalo 24.28

CANADA

Pig Iron

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

	Per Gross Ton
Domestic, 80% (carload)	$85.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$26.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	$77.50
50% (ton lots)	85.00
75% (carloads)	126.00
75% (ton lots)	136.00
14% to 16% (f.o.b.) Welland, Ont. (in carloads) (duty paid)	31.00
14% to 16% (less carloads)	38.50

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$22.75	12%	$29.25
7%	23.75	13%	30.75
8%	24.75	14%	32.25
9%	25.75	15%	33.75
10%	26.75	16%	35.25
11%	27.75	17%	36.75

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$27.75	14%	$33.25
11%	28.75	15%	34.75
12%	30.25	16%	36.25
13%	31.75	17%	37.75

Manganese 1½ to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W. del., carloads	$1.35 to $1.40
Ferrotungsten, less carloads	1.45 to 1.55
Ferrocromium, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered, in carloads	10.00c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del., per lb. contained V	$2.70 to $2.90
Ferrocarbontitanium, 15 to 18% Ti, 6 to 8% C, f.o.b. furnace carload and contract per net ton	$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with $2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with $2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	$38.00
Ton lots or less, per ton	45.50
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	90.00
2% carbon grade	95.00
1% carbon grade	105.00
Spot prices	$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:		
No. 1 heavy melting steel	$10.00 to	$10.50
No. 2 heavy melting steel	9.00 to	9.50
No. 2 railroad wrought	10.00 to	10.50
Scrap rails	10.00 to	10.50
Rails 3 ft. and under	13.50 to	14.00
Compressed sheet steel	10.00 to	10.50
Hand bundled sheet steel	9.00 to	9.50
Hvy. steel axle turnings	9.00 to	9.50
Machine shop turnings	6.75 to	7.25
Short shov. turnings	6.75 to	7.25
Short mixed borings and turnings	6.50 to	7.00
Cast iron borings	6.50 to	7.00
Cast iron carwheels	11.00 to	11.50
Heavy breakable cast	10.00 to	10.50
No. 1 cast	11.00 to	11.50
Railr. knuckles and couplers	13.00 to	13.50
Rail. coil and leaf springs	13.00 to	13.50
Rolled steel wheels	13.00 to	13.50
Low phos. billet crops	13.00 to	13.50
Low phos. sheet bar crops	12.00 to	12.50
Low phos. plate scrap	12.00 to	12.50
Low phos. punchings	12.50 to	13.00
Steel car axles	13.00 to	13.50

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton	
Heavy melting steel	$8.50 to	$9.00
Automobile hvy. melt. steel	8.00 to	8.50
Shoveling steel	8.50 to	9.00
Hydraulic comp. sheets	7.75 to	8.25
Drop forge flashings	6.50 to	7.00
No. 1 busheling	7.50 to	8.00
Rolled carwheels	10.00 to	10.50
Railroad tires	10.00 to	10.50
Railroad leaf springs	10.00 to	10.50
Axle turnings	8.00 to	8.50
Steel couplers and knuckles	10.00 to	10.50
Coil springs	10.50 to	11.00
Axle turnings (elec. fur.)	8.00 to	8.50
Low phos. punchings	10.00 to	10.50
Low phos. plates, 12 in. and under	10.00 to	10.50
Cast iron borings	4.50 to	5.00
Short shoveling turnings	4.50 to	5.00
Machine shop turnings	4.25 to	4.75
Rerolling rails	10.00 to	10.50
Steel rails, less than 3 ft.	10.75 to	11.25
Steel rails, less than 2 ft.	11.25 to	11.75
Angle bars, steel	9.50 to	10.00
Cast iron carwheels	9.50 to	10.00
Railroad malleable	9.00 to	9.50
Agricultural malleable	7.75 to	8.25

Per Net Ton		
Iron car axles	$12.00 to	$12.50
Steel car axles	10.00 to	10.50
No. 1 railroad wrought	7.00 to	7.50
No. 2 railroad wrought	7.50 to	8.00
No. 2 busheling	3.50 to	4.00
Locomotive tires, smooth	9.00 to	9.50
Pipe and flues	4.50 to	5.00
No. 1 machinery cast	8.00 to	8.50
Clean automobile cast	8.00 to	8.50
No. 1 railroad cast	7.50 to	8.00
No. 1 agricultural cast	7.00 to	7.50
Stove plate	5.25 to	5.75
Grate bars	4.75 to	5.25
Brake shoes	6.00 to	6.50

PHILADELPHIA

Per gross ton delivered consumers' yards:		
No. 1 heavy melting steel	$9.25 to	$9.75
No. 2 heavy melting steel	$8.00 to	8.50
No. 1 railroad wrought	$11.00 to	11.50
Bundled sheets	....	9.00
Hydraulic compressed, new	9.00 to	9.50
Hydraulic, compressed, old	6.50 to	7.00
Machine shop turnings	5.50 to	6.00
Heavy axle turnings	8.50 to	9.00
Cast borings	5.00 to	5.50
Heavy breakable cast	9.50 to	10.00
Stove plate (steel works)	....	8.00
No. 1 low phos. heavy	13.00 to	14.00
Couplers and knuckles	12.50 to	13.00
Rolled steel wheels	12.50 to	13.00
No. 1 blast furnace	5.00 to	5.50
Spec. iron and steel pipe	....	8.00
Shafting	15.00 to	16.00
Steel axles	....	14.50
No. 1 forge fire	....	9.00
Cast iron car wheels	11.00 to	11.50
No. 1 cast	11.50 to	12.00
Cast borings (chem.)	12.00 to	14.00
Steel rails for rolling	....	12.00

CINCINNATI

Dealers' buying prices per gross ton:		
Heavy melting steel	$6.75 to	$7.25
Scrap rails for melting	8.00 to	8.50
Loose sheet clippings	3.00 to	3.50
Bundled sheets	5.50 to	6.00
Cast iron borings	4.50 to	5.00
Machine shop turnings	4.00 to	4.50
No. 1 busheling	5.50 to	6.00
No. 2 busheling	2.50 to	3.00
Rails for rolling	8.50 to	9.00
No. 1 locomotive tires	8.25 to	8.75
Short rails	11.00 to	11.50
Cast iron carwheels	7.50 to	8.00
No. 1 machinery cast	8.75 to	9.25
No. 1 railroad cast	8.25 to	8.75
Burnt cast	5.75 to	6.25
Stove plate	5.75 to	6.25
Agricultural malleable	7.75 to	8.25
Railroad malleable	7.75 to	8.25

CLEVELAND

Per gross ton delivered consumers' yards:		
No. 1 heavy melting steel	$8.00 to	$8.50
No. 2 heavy melting steel	7.50 to	8.00
Compressed sheet steel	7.25 to	7.75
Light bundled sheet stampings	6.50 to	7.00
Drop forge flashings	7.00 to	7.50
Machine shop turnings	6.00 to	6.50
Short shoveling turnings	6.50 to	7.00
No. 1 busheling	7.00 to	7.50
Steel axle turnings	7.00 to	7.50
Low phos. billet crops	12.50 to	13.00
Cast iron borings	6.25 to	6.75
Mixed borings and short turnings	6.25 to	6.75
No. 2 busheling	6.25 to	6.75
No. 1 cast	10.50 to	11.00
Railroad grate bars	7.00 to	7.50
Stove plate	6.50 to	7.00
Rails under 3 ft.	12.50 to	13.00
Rails for rolling	15.50 to	18.00
Railroad malleable	11.50 to	12.00
Cast iron carwheels	9.75 to	10.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:		
No. 1 heavy melting steel	$9.50 to	$10.50
No. 2 heavy melting scrap	8.50 to	9.00
Scrap rails	9.50 to	10.00
New hydraul. comp. sheets	8.50 to	9.00
Old hydraul. comp. sheets	7.50 to	8.00
Drop forge flashings	8.50 to	9.00
No. 1 busheling	8.50 to	9.00
Hvy. steel axle turnings	6.50 to	7.00
Machine shop turnings	5.00 to	5.50
Knuckles and couplers	11.00 to	11.50
Coil and leaf springs	11.00 to	11.50
Rolled steel wheels	11.00 to	11.50
Low phos. billet crops	11.50 to	12.00
Short shov. steel turnings	5.50 to	6.00
Short mixed borings and turnings	5.50 to	6.00
Cast iron borings	5.50 to	6.00
No. 2 busheling	5.00 to	5.50
Steel car axles	10.50 to	11.00
Iron axles	10.50 to	11.00
No. 1 machinery cast	10.00 to	10.50
No. 1 cupola cast	9.00 to	9.50
Stove plate	8.50 to	8.75
Steel rails, 3 ft. and under	12.00 to	12.50
Cast iron carwheels	10.00 to	10.50
Industrial malleable	10.00 to	10.50
Railroad malleable	10.00 to	10.50
Chemical borings	7.00 to	7.50

BOSTON

Dealers' buying prices per gross ton:		
No. 1 heavy melting steel	$5.50 to	$6.00
Scrap T rails	5.50 to	6.00
No. 2 steel	5.00 to	5.25
Breakable cast	6.00 to	6.50
Machine shop turnings	1.00 to	1.25
Bundled skeleton, long	3.30 to	3.50
Forge flashings	4.25 to	4.50
Blast furnace scrap	2.00 to	2.50
Shafting	11.00 to	11.25
Steel car axles	10.50 to	11.00
Cast iron borings, chemical	6.00 to	7.00
Stove plate	....	6.50

Per gross ton delivered consumers' yards:		
Textile cast	$7.50 to	$9.00
No. 1 machinery cast	7.50 to	9.00
Railroad malleable	11.00 to	11.50

NEW YORK

Dealers' buying prices per gross ton:		
No. 1 heavy melting steel	*$7.00	†$8.00
No. 2 heavy melting steel	*5.50 to	†6.50
Heavy breakable cast	6.00 to	6.50
No. 1 machinery cast	7.00 to	7.50
No. 2 cast	6.25 to	6.75
Stove plate	5.00 to	5.50
Steel car axles	11.50 to	12.00
No. 1 railroad wrought	7.50 to	8.00
No. 1 yard wrought, long	6.50 to	7.00
Spec. iron and steel pipe	4.50 to	5.00
Forge fire	5.50 to	6.00
Rails for rerolling	7.50 to	8.50
Short shoveling turnings	2.50 to	3.00
Machine shop turnings	2.50 to	3.00
Cast borings	3.50 to	3.75
No. 1 blast furnace	2.00 to	2.50
Cast borings (chemical)	11.00 to	11.50
Unprepared yard iron and steel	3.00 to	4.00

Per gross ton, delivered local foundries:	
No. 1 machinery cast	$10.25
No. 1 hvy. cast (cupola size)	9.00
No. 2 cast	8.00

*For direct car loading only.
†Loading on barge.

BIRMINGHAM

Per gross ton delivered consumers' yards:		
Heavy melting steel	....	$8.50
Scrap steel rails	....	9.00
Short shoveling turnings	....	5.50
Stove plates	....	6.50
Steel axles	$10.50 to	11.00
Iron axles	10.50 to	11.00
No. 1 railroad wrought	....	5.50
Rails for rolling	....	10.50
No. 1 cast	9.50 to	10.00
Tramcar wheels	9.00 to	9.50
Cast iron borings, chem.	....	8.00

ST. LOUIS

Per gross ton delivered consumers' yards:		
Selected heavy steel	$8.75 to	$9.25
No. 1 heavy melting	7.00 to	7.50
No. 2 heavy melting	6.50 to	7.00
No. 1 locomotive tires	9.50 to	10.00
Misc. stand-sec. rails	8.75 to	9.25
Railroad springs	9.00 to	9.50
Bundled sheets	6.00 to	6.50
No. 2 railroad wrought	8.00 to	8.50
No. 1 busheling	5.00 to	5.50
Cast iron borings and shoveling turnings	2.50 to	3.00
Rails for rolling	9.75 to	10.25
Machine shop turnings	2.50 to	3.00
Heavy turnings	5.50 to	6.00
Steel car axles	10.50 to	11.00
Iron car axles	12.50 to	13.00
No. 1 railroad wrought	5.50 to	6.00
Steel rails less than 3 ft.	10.75 to	11.25
Steel angle bars	9.00 to	9.50
Cast iron carwheels	7.50 to	8.00
No. 1 machinery cast	8.50 to	9.00
Railroad malleable	8.50 to	9.00
No. 1 railroad cast	8.50 to	9.00
Stove plate	6.50 to	7.00
Agricult. malleable	8.50 to	9.00

DETROIT

Dealers' buying prices per gross ton:		
Heavy melting steel	$6.75 to	$7.25
Borings and short turnings	4.75 to	5.25
Long turnings	$3.75 to	$4.25
No. 1 machinery cast	9.00 to	9.50
Automotive cast	9.75 to	10.25
Hydraul. comp. sheets	6.75 to	7.25
Stove plate	6.25 to	6.75
New factory busheling	5.75 to	6.25
Old No. 2 busheling	4.00 to	4.50
Sheet clippings	3.00 to	3.50
Flashings	5.50 to	6.00
Low phos. plate scrap	7.00 to	7.50

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$5.50	$5.50
Rails scrap	6.00	4.50
Machine shop turnings	2.50	2.50
Boiler plate	4.50	4.50
Heavy axle turnings	2.50	2.50
Cast borings	3.00	3.00
Steel borings	2.00	2.00
Wrought pipe	2.50	2.50
Steel axles	4.50	6.00
Axles wrought iron	4.50	6.50
No. 1 machinery cast	7.75	9.00
Stove plate	4.50	5.00
Standard carwheels	7.25	7.00
Malleable	6.75	7.00

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.5% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore

C.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	9.50c.
Iron, low phos., Swedish, average 68½% iron	9.50c.
Iron, basic or foundry, Swedish, average, 65% iron	9c.
Iron, basic or foundry, Russian, aver. 65% iron	9c.
Manganese, Caucasian, washed 52%	26c.
Manganese, African, Indian, 44-48%	21c.
Manganese, African, Indian, 49-51%	24c.
Manganese, Brazilian, 46 to 48½%	20c.

	Per Net Ton Unit
Tungsten, Chinese, wolframite, duty paid, delivered*	$17.50 to $18.50
Tungsten, domestic scheelite, delivered†	17.00

	Per Gross Ton
Chrome, 45%, Cr_2O_3, crude, c.i.f. Atlantic Seaboard	$17.00
Chrome, 48% Cr_2O_3, c.i.f. Atlantic Seaboard	20.00

*Quotations nominal in absence of sales.
†Nominal; no supplies available.

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines for all-rail shipment	$15.50 to $16.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	17.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	$15.50 to 16.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	19.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville Prompt	$3.85
Foundry, f.o.b. Connellsville Prompt	$4.60 to 5.10
Foundry, by-product, Chicago ovens, for delivery outside switching district	8.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	11.00
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Phila.	9.00
Foundry, by-product, Cleveland, delivered	$9.25
Foundry, Birmingham	6.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.80 to $2.05
Mine run coking coal f.o.b. W. Pa.	2.05 to 2.25
Gas coal, ¾-in. f.o.b. Pa. mines	2.25 to 2.55
Mine run gas coal, f.o.b. Pa. mines	2.05 to 2.45
Steam slack, f.o.b. W. Pa. mines	1.55 to 1.65
Gas slack, f.o.b. W. Pa. mines	1.90 to 2.10

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. f.o.b. Baltimore	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. del'd Chicago	
No. 3 industrial fuel oil	3.88c.
No. 5 industrial fuel oil	3.38c.

Per Gal. f.o.b. Cleveland	
No. 3 distillate	5.50c.
No. 4 industrial	5.25c.
No. 5 industrial	4.50c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works High-heat Duty Brick	Intermediate Duty Brick
Pennsylvania	$45.00	$40.00
Maryland	45.00	40.00
New Jersey	55.00	43.00
Ohio	45.00	40.00
Kentucky	45.00	40.00
Missouri	45.00	40.00
Illinois	45.00	40.00
Ground fire clay, per ton	7.00	

Chrome Brick

	Per Net Ton
Standard size	$45.00

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$45.00
Chicago	54.00
Birmingham	55.00
Silica clay, per ton	8.00

Magnesite Brick

	Per Net Ton
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	$65.00
Unburned, f.o.b. Baltimore	55.00
Imported grain magnesite, f.o.b. Baltimore and Chester, Pa.	45.00
Domestic grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock—	
Rounds and hexagons	*2.45c.
Squares and flats	*2.45c.
Hoops and bands under ¼ in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.69
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count, 65 per cent off list.	
Machine bolts, 100 count, 65 per cent off list.	
Carriage bolts, 100 counts, 65 per cent off list.	
Nuts, all styles, 100 count, 65 per cent off list.	
Large rivets, base per 100 lb.	$3.50
Wire, black, soft ann'l'd, base per 100 lb.	*2.70c.
Wire, galv. soft, base per 100 lb.	*2.925c.
Common wire nails, per keg	*2.834c.
Cement coated nails, per keg	*2.834c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 1999 lb.

*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.20c.
Soft steel bars	2.95c.
Cold-fin. steel bars and shafting	
Rounds and hexagons	3.50c.
Flats and squares	3.50c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (9/16 in. and lighter)	3.50c.
Track bolts	4.65c.
Rivets, structural (keg lots)	3.50c.
Rivets, boiler (keg lots)	3.60c.
	Per Cent Off List
Machine bolts	60 and 5
Carriage bolts	60 and 5
Coach and lag screws	60 and 5
Hot-pressed nuts, sq. tap. or blank	60 and 5
Hot-pressed nuts, hex. tap or blank	60 and 5
Hex. head and cap screws	80
Cup point set screws	70 and 10
Flat head bright wood screws	37½ and 10
Spring cotters	50
Stove bolts in full packages	70 and 10
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	$4.50 off list
No. 8 black ann'l'd wire per 100 lb.	$3.85
Com. wire nails, base per keg	3.05c.
Cement c't'd nails, base per keg	3.05c.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, small shapes	3.22c.
Iron bars	3.22c.
Iron bars, swed. charcoal	6.50 to 7.25c.
Cold-fin. shafting and screw stock;	
Rounds and hexagons	3.92c.
Flats and squares	4.42c.
Cold-roll. strip, soft and quarter hard	3.32c.
Hoops	3.52c.
Bands	3.52c.
Hot-rolled sheets (No. 10)	3.27c.
Hot-rolled ann'l'd sheets (No. 24*)	3.85c.
Galvanized sheets (No. 24*)	4.50c.
Long terne sheets (No. 24)	5.20c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.25c.
Wire, galv. (No. 10)	3.85c.
Tire steel, 1 x ½ in. and larger	3.65c.
Open hearth spring steel	4.00c. to 10.00c.
Common wire nails, base, per keg	$3.21
	Per Cent
Machine bolts, cut thread:	Off List
All diameters	70
Carriage bolts cut thread:	
All diameters	70
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.44c.
Bars, soft steel or iron	3.19c.
Cold-fin. rounds, shafting, screw stock	3.74c.
Hot-rolled annealed sheets (No. 24)	4.09c.
Galv. sheets (No. 24)	4.79c.
Hot-rolled sheets (No. 10)	3.29c.
Black corrug. sheets (No. 24)	4.09c.
*Galv. corrug. sheets	4.79c.
Structural rivets	3.99c.
Boiler rivets	4.09c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fittings up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts	
1000 lb. or over	60 and 5
200 to 999 lb.	60
100 to 199 lb.	55
Less than 100 lb.	50

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	2.95c.
*Structural shapes	2.95c.
*Soft steel bars, small shapes, iron bars (except bands)	2.90c.
‡Reinforc. steel bars, sq. twisted and deformed	2.955c.
Cold-finished steel bars	3.75c.
*Steel hoops	3.40c.
*Steel bands, No. 12 and 3/16 in., incl.	3.15c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	3.55c.
†Galvanized sheets (No. 24)	4.25c.
*Hot-rolled annealed sheets (No. 10)	3.05c.
Diam. pat. floor plates, ¼ in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c.
Soft steel bars	2.95c.
Reinforc. steel bars	*2.12c.
Cold-finished steel bars	3.40c.
Flat-rolled steel under ¼ in.	3.36c.
Cold-finished strip	†3.00c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
Black ann'l'd wire, per 100 lb.	$2.65
No. 9 galv. wire, per 100 lb.	3.00
Com. wire nails, base per keg	2.40

*Plus mill, size and quantity extras.

†Outside delivery 10c. less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.15c.
New billet reinforc. bars	3.25c.
Rail steel reinforc. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.45c.
Cold-finished bars	3.70c.
Hot-rolled annealed sheets (No. 24)	4.00c.
Galv. sheets (No. 24)	4.70c.
Hot-rolled sheets (No. 10)	3.20c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.91
Com. wire nails, base per keg (1 to 24 kegs)	3.50
25 to 50 kegs	3.30
Larger quantities	3.10
Cement c't'd nails, base 100-lb. keg	3.50
Chain, 1-in., per 100 lb.	8.35
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$19.03
4-in.	44.96
Lap-welded steel boiler tubes, 2-in.	18.10
4-in.	42.32

BUFFALO

	Base per Lb.
Plates	3.37c.
Struc. shapes	3.25c.
Soft steel bars	3.00c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.55c.
Round and hex.	3.55c.
Cold-rolled strip steel	3.39c.
Hot-rolled annealed sheets (No. 24)	4.05c.
Heavy hot-rolled sheets, 3/16 in., 24 to 48 in. wide	3.62c.
Galv. sheets (No. 24)	4.65c.
Bands	3.42c.
Hoops	3.42c.
Hot-rolled unannealed sheets	3.17c.
Com. wire nails, base per keg	$3.35
Black wire, base per 100 lb.	3.45c.

BOSTON

	Per Lb.
Beams, channels, angles, tees, zees	3.52c.
H beams and shapes	3.52c.*
Plates—sheared, tank and univ. mill, ¼ in. thick and heavier	3.52c.*
Floor plates, diamond pattern	5.33c.
Bar and bar shapes (mild steel)	3.30c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.60c to 4.60c.
Half rounds, half ovals, ovals and bevels	4.55c.
Tire steel	4.55c.
Cold-finished rounds and hexagons	5.25c.*
Cold-rolled strip steel	3.245c.
Cold-finished squares and flats	5.75c.
Blue annealed sheets, No. 10 gal.	3.60c.
One pass cold-rolled sheets No. 24 ga.	4.15c.
Galvanized steel sheets, No. 24 ga.	4.85c.
Lead coated sheets, No. 24 ga.	5.80c.

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.

*Base.

PACIFIC COAST

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.55c.	3.70c.	3.55c
Shapes, standard	3.55c.	3.70c.	3.55c.
Soft steel bars	3.60c.	3.70c.	3.55c.
Reinforcing bars	3.50c.	3.50c.	3.50c.
Hot-rolled annealed sheets (No. 24)	4.40c.	4.45c.	4.40c.
Hot-rolled sheets (No. 10)	3.75c.	3.80c.	3.75c
Galv. sheets (No. 24)	5.00c.	5.05c.	5.00c.
Cold finished steel			
Rounds	5.95c.	5.95c.	4.75c.
Squares and hexagons	7.20c.	7.20c.	6.00c.
Flats	7.70c.	7.70c.	7.00c.
Common wire nails —base per keg	$3.40	$3.25	$3.35
less carload			

All items subject to differentials for quantity.

Fabrication-in-Transit Privilege Defined—Other Code Resolutions

FURTHER clarification of the fabrication-in-transit privilege accorded fabricators of structural shapes, plates and bars under the iron and steel code is accomplished by the issuance of Regulations No. 9, prescribed by the directors of the American Iron and Steel Institute on Sept. 13, to become effective Oct. 10. These regulations supersede commercial resolution No. A16 which has been rescinded.

The new regulations provide that purchasers of bars, plates and shapes for identified structures who take advantage of fabrication-in-transit privileges must file affidavits with code members showing that material has been used for the purpose specified in the sale contract, as well as freight bills of lading and other information needed to further identify the project. The regulations are evidently intended to prevent certain abuses of the fabrication-in-transit privilege which have been encountered recently.

Sales to Government

Allowances of freight charges on products sold to Government departments or divisions have been covered by commercial resolution No. A13, which has been revised, effective Oct. 1. The revised resolution provides that code members bidding on Government work must submit with their bids certain provisions which are specified in blank form by the resolution. The same restrictions are made in the case of sales to jobbers for resale to Government departments or divisions.

Pipe Sales on Pacific Coast

Deductions not exceeding 25 per cent from the carload price of pipe sold by jobbers in the Pacific Coast States are permitted on less-than-carload sales in that territory by commercial resolution No. A31. The deductions may be made by all jobbers who have jobbers' agreements with mills and may apply on all types of butt-welded pipe either black or galvanized. The resolution is expected to correct certain local competitive conditions.

Lead Buying Is Heavy With Price Advance in Prospect—Zinc Lower

Spelter Quotations Off 10 Points With Consumers Still Indifferent—Tin Weaker in Sympathy With Sterling Decline—Copper Quiet With Prices Weak Abroad

NEW YORK, Oct. 2.—The copper market remains featureless, with sales again averaging little more than a 100 tons daily. The price remains firm at 9c., Connecticut Valley, but the market at London continues very weak. Electrolytic copper was quotable abroad this morning at 6.65c. a lb., usual Continental base ports, a decline of 20 points a lb. from a week ago. If the disparity between the Blue Eagle price here and quotations abroad continues to increase, it is not unlikely that United States producers may make some effort to consult with foreign producers on the situation. United States consumption of copper during September is estimated at just under 30,000 tons, having fallen under the copper code sales quota of 30,750 tons for the first time. In the first eight months of the year consumption averaged 38,000 tons monthly. Leading producers have announced that if consumption continues to average under the sales quota or book established by the code, steps will be taken to reduce production. However, output will be kept at the highest point possible in order to provide maximum employment in the industry. It is indicated that large consumers of copper in the electrical, automotive, refrigerator and other industries have bought very little in recent months and order books at brass and wire mills are abnormally low. PWA and naval expenditures are also bound to be felt and will add to the accumulated demand for copper.

Lead

The improved statistical position of the market and the attractive price level reached last week resulted in considerable buying. Quotations weakened late last Tuesday and lead was quoted Wednesday at 3.45c. a lb., St. Louis, and 3.60c., New York, a decline of five points. Heavy sales were made at these figures and sellers adopted a more conservative price policy yesterday. One interest advanced its quotations five points and sales were reported at the higher figure, even though other sellers continued to quote 3.45c. and 3.60c. today. Considerable November metal has been placed and the October position is now fairly well covered.

Tin

Tin prices have declined steadily in the last week, reflecting the steady drop in the pound. Many buyers now seem inclined to defer commitments until sterling becomes stabilized to some extent with relation to the dollar, and a level of around the old par of 4.87 would not be unexpected. Consumption of tin seems to be declining, although tin plate production is fairly well sustained. Prompt Straits metal was quoted in New York this morning at 50.95c. a lb., compared with 51.50c. one week ago. London prices on first call were £231 10s. and £228 10s. for spot and future standard respectively and £229 15s. for Straits at Singapore.

Zinc

Demand for spelter continues very dull in spite of two price reductions of five points each which were made last week. The 4c. a lb., East St. Louis, quotation weakened late last Tuesday and zinc was available the following day at 3.95c., East St. Louis, and 4.30c., New York. Additional softness developed Friday and the price Saturday was off another five points. It continues quotable today at 3.90c. and 4.25c. in the two leading markets. Price weakness did not stimulate sales, which amounted to only 1400 tons last week, compared with 1500 tons in the previous period. Concentrates in the Joplin area are also off $1 a ton, being quotable at $22 and $23 a ton, respectively, for the flotation and prime grades. Production amounted to 6000 tons, compared with shipments of 6500 tons, but with sales of only 4000 tons. Stocks at the end of the month were 17,750 tons.

The Week's Prices. Cents Per Pound for Early Delivery

	Sept. 26	Sept. 27	Sept. 28	Sept. 29	Oct. 1	Oct. 2
Electrolytic copper, N. Y.*	8.75	8.75	8.75	8.75	8.75	8.75
Lake copper, N. Y.	9.12½	9.12½	9.12½	9.12½	9.12½	9.12½
Straits tin, Spot, New York	51.62½	51.50	51.50	....	50.95	50.95
Zinc, East St. Louis	3.95	3.95	3.95	3.90	3.90	3.90
Zinc, New York	4.30	4.30	4.30	4.25	4.25	4.25
Lead, St. Louis	3.45	3.45	3.45	3.45	3.45	3.45
Lead, New York	3.60	3.60	3.60	3.60	3.60	3.60

*Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, 98-99 per cent, 22.90c. a lb., delivered; new No. 12, 19.50c. a lb., delivered.
Aluminum, remelt No. 12 (alloy), carload lots delivered, 14.50c. a lb., average for week.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 8.87½c. a lb., New York.
Brass ingots, 85-5-5-5, 8.25c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	53.00c. to 54.00c.
Tin, bar	55.00c. to 56.00c.
Copper, Lake	10.25c. to 11.00c.
Copper, electrolytic	10.00c. to 10.50c.
Copper, castings	9.75c. to 10.75c.
*Copper sheets, hot-rolled	16.00c.
*High brass sheets	14.50c.
*Seamless brass tubes	17.00c.
*Seamless copper tubes	17.25c.
*Brass rods	13.00c.
Zinc, slabs	5.75c. to 6.75c.
Zinc sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	4.50c. to 5.50c.
Lead, bar	5.50c. to 6.50c.
Lead, sheets	7.50c.
Antimony, Asiatic	10.00c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ½	32.00c. to 33.00c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	55.75c.
Tin, bar	57.75c.
Copper, Lake	10.00c.
Copper, electrolytic	10.00c.
Copper, castings	9.75c.
Zinc, slab	5.75c. to 6.00c.
Lead, American pig	4.75c. to 5.00c.
Lead, bar	7.75c.
Antimony, Asiatic	9.00c.
Babbitt metal, medium grade	18 50c.
Babbitt metal, high grade	60.25c.
Solder, ½ and ½	33.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	6.25c.	7.00c.
Copper, hvy. and wire	5.75c.	6.50c.
Copper, light and bottoms	4.87½c.	5.75c.
Brass, heavy	3.12½c.	3.75c.
Brass, light	2.75c.	3.37½c.
Hvy. machine composition	4.75c.	5.25c.
No. 1 yel. brass turnings	4.37½c.	5.12½c.
No. 1 red brass or compos. turnings	4.25c.	5.25c.
Lead, heavy	2.87½c.	3.37½c.
Zinc	2.25c.	3.00c.
Cast aluminum	9.62½c.	10.75c.
Sheet aluminum	11.00c.	12.50c.

Non-Ferrous Averages

THE average prices of the major non-ferrous metals for September, based on daily quotations in THE IRON AGE, are as follows:

	Average
Electrolytic copper, N. Y.*‡	8.75c. a lb.
Lake copper, Eastern delivery*	9.12½c. a lb.
Straits, tin, Spot, N. Y.	51.52c. a lb.
Zinc, East St. Louis	4.075c. a lb.
Zinc, New York	4.425c. a lb.
Lead, St. Louis	3.53c. a lb.
Lead, New York	3.68c. a lb.

*Blue Eagle copper. ‡Price ¼c. higher in Connecticut Valley.

Large Exports Sustain Coast Scrap Market

SAN FRANCISCO, Oct. 1.—The improved tone of the scrap market on the Coast is due in a large part to the Japanese demand. It is estimated that 100,000 tons of scrap has been loaded at California ports alone during the last nine months. This exportation approximates 20 per cent of the total scrap movement. Although specifications vary at each port, Japanese prices are reported to range from $7 to $8 per gross ton. No. 1 heavy melting steel for domestic consumption brings $10 to $12.

Scrap dealers' yards are comparatively bare, but this does not indicate that the sources of supply are more limited. Mills have not had to pay increased prices on recent purchases, which have been fairly regular and of sizable tonnage. Scrapping of several warships has increased the supply of higher quality metal. Pig iron production has been constant during the quarter, although activity in the finishing mills has been less; hence an increased ingot inventory.

At Kansas City, Mo., it is reported that Hardwick & McGlone are low bidders, at $7,916,280, for constructing a spillway for the Fort Peck dam, located near Glasgow, Mont. A minimum of 18,000 tons of reinforcing bars and 722 tons of steel sealing strips will be required. To date San Francisco has not placed an award for 7469 tons of cast iron pipe for a high pressure line.

Outstanding among the week's bookings was the letting of 3000 tons of plates by the Standard Oil Co. of California for 11 steel tanks at Rio Bravo, and Estero Bay, Cal. Western Pipe & Steel Co. booked 1350 tons, while 1650 tons was taken by Consolidated Steel Corpn. An award of the general contract for the George Washington school at San Francisco is expected shortly. It is now reported that 1100 tons of reinforcing bars will be required. Revised bids are to be taken on the San Francisco psychopathic cancer building, which will require 800 tons of structural steel and several hundred tons of reinforcing bars. Specifications are to be issued shortly at Sausalito, Cal., for a yacht harbor calling for 400 tons of sheet piling.

Cast Iron Pipe

Carolina Beach, N. C., Norman L. Mintz, 605 South Sixteenth Street, Wilmington, N. C., city clerk, in charge, asks bids until Oct. 12 for 10,300 ft. of 2, 6 and 8-in. for water supply. J. L. Becton, Wilmington, is engineer.

Water Commission, East Orange, N. J., will soon ask bids for new water trunk line from municipal reservoir at White Oak Ridge, Millburn, to city, supplementing present 24-in. line. Cost about $150,000. Roswell M. Roper is engineer.

Bayonne, N. J., plans trunk water pipe line. Fund of $600,000 has been secured through Federal aid. Mayor F. L. Donohoe is in charge.

Bushton, Kan., plans water pipe line. Bond issue of $28,000 has been authorized for this and other waterworks construction.

Wells, Tex., will soon ask bids for about 3 miles of 2, 6 and 8-in. for water line. Joseph Rady, Majestic Building, Fort Worth, Tex., is consulting engineer.

Kaysville, Utah, plans new water pipe line, replacing present wood pipe. Cost about $58,000. Caldwell & Richards, Templeton Building, Salt Lake City, Utah, are consulting engineers.

Sweetwater, Tex., plans about eight miles of 14-in. for main water line, including two central pumping stations. Bond issue of $160,000 has been voted. Hawley, Freese & Nichols, Capps Building, Fort Worth, Tex., are consulting engineers.

Broken Bow, Neb., plans about 12,000 ft., of 4, 6 and 8-in. for water supply. Special election has been called for Oct. 9 to approve bond issue of $25,000. F. A. Raasch is superintendent of water department.

Greenfield, Ill., asks bids until Oct. 23 for water pipe line and other waterworks construction. Fund of $79,000 has been arranged. Warren & Van Praag, Milliken Building, Decatur, Ill., are consulting engineers.

Bland, Mo., will soon take bids for water pipe line and other waterworks improvements. Fund of $44,500 has been secured through Federal aid. George E. Wells, Inc., 420 Security Building, St. Louis, is consulting engineer.

Northboro, Mass., plans water pipe line. Weston & Sampson, 14 Beacon Street, Boston, are consulting engineers.

San Clemente, Cal., has awarded 430 tons of 4 to 10-in. to American Cast Iron Pipe Co.

Los Angeles, placed 360 tons for an outfall sewer with American Cast Iron Pipe Co.

Sandy City, Utah, has let 100 tons to Pacific States Cast Iron Pipe Co.

Oakland, Cal., will take bids Oct. 10 on 650 tons of 4 to 8-in.

Mining Activity Aids Canadian Market

TORONTO, ONT., Oct. 2.—The mining industry is responsible for a steady demand for steel, machinery and tools. It is estimated that within the next 12 months there will be some 100 new producing mines in Canada, indicating heavy purchase of mining and milling equipment. Shipments of freight to various mining centers of the Dominion are breaking all former records. Noranda Mines started work this week on a 500-ton addition to its cyanidization plant and will spend several hundred thousand dollars on additions to other equipment. It is stated that Consolidated Mining & Smelting Co., has taken over the property of Chibougamau Prospectors in the Chibougamau district of Quebec and is considering a railroad to the field, the installation of a large smelter and intensive mine development. Already about $100,000 worth of equipment and supplies has been purchased and is being moved to the property by several airplanes. Other large mining operations are under way in many sections of Canada and heavy purchases and big shipments will go forward over the winter roads.

An order for 500 tons of pig iron, making the largest individual award in upward of a year, is reported to have been placed by the Port Hope Sanitaryware Mfg. Co. Most melters still refuse to lay in big stocks against future needs. Production is holding around 35,000 to 40,000 tons per month, with three blast furnaces active. Prices are firm and unchanged.

Consumers of scrap are taking small tonnages of special grades for immediate needs, but otherwise are showing no interest in the market. Dealers are out of the market and prices lists are unchanged.

Sheet Demand Fair At Cincinnati

CINCINNATI, Oct. 2.—Foundries are still operating at a low rate, but find their prospects for business improved. The lack of a price stimulus to commitments is keeping furnace books devoid of appreciable new business. A few third quarter contracts were rewritten, but the usually general desire to cover is lacking.

Demand for finished sheets is steady at about 34 per cent of mill capacity. Automobile demand is at low ebb, current orders coming from widely scattered sources. The leading district interest reports better than 50 per cent operations at its Middletown unit.

Warehouse business during September exceeded August tonnage slightly. Business is largely industrial and consists of small orders from miscellaneous sources.

Scrap is dull. Mills refuse new commitments and current business is small and urgent.

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Turned and Polished Shafting — Turned and Ground Shafting

Pipe Lines

Texas Gas Utilities Co., Del Rio, Tex., let contract to N. A. Saigh Co., Builders' Exchange Building, San Antonio, Tex., for 4-in. welded steel pipe line from natural gas fields in Zavalla County to Uvalde, Tex., about 12 miles. Cost about $50,000.

Pennsylvania Gas Co., Warren, Pa., contemplates new steel natural gas pipe line from point near Jamestown, N. Y., to Bemus Point, N. Y., and vicinity, about 10 miles.

United States Engineer Office, Custom House, St. Louis, closes bids Oct. 6 for 600 ft. 34-in. steel dredge pipe in 50-ft. sections.

Lindsborg, Kan., approved bond issue of $55,000 at special election for steel pipe line system for gas distribution. F. E. Devlin, Wheeler-Kelly-Hagny Building, Wichita, Kan., is consulting engineer.

F. C. Henderson Co., Amarillo, Tex., plans steel pipe line for natural gas supply for two new carbon black plants near Stanford, Tex., for which permission has been secured.

New Ulm, Minn., plans new steel pipe line from municipal steam plant to distribution station on Minnesota Street for live steam supply. Carl W. Franks, City Hall, is city engineer in charge.

H. P. Rothwell, Gillette, Wyo., is at head of project to build welded steel pipe line from natural gas fields to city, about 25 miles, and local gas distribution plant for commercial gas supply.

A New DAVIS KEYSEATER
Tilting Table Type

The outstanding feature of this new machine is the tilting table which may be set at any angle required for cutting straight or tapered keyways in bores tapering up to 3" per foot.

The cutter remains vertical at all stages of the operation, making it easy to set up the work.

The table is hand fed by a lever at the front, an adjustable stop being provided to limit the depth of cut.

The same broach type cutters are used as in the older machines of fixed table type.

Built in three sizes to cut keyways from 1/16" to 1½" in width. Send for circular giving complete details.

DAVIS KEYSEATER COMPANY

400 Exchange Street ROCHESTER, NEW YORK

Fabricated Structural Steel

Awards Higher—New Projects Decline

STRUCTURAL steel lettings at 15,850 tons are more than double those of a week ago. Sizable awards include 3400 tons for Pier 32 in the Hudson River at New York, 2025 tons for the Internal Revenue Building, Washington, and 1400 tons for the Rundel Memorial Library at Rochester, N. Y. New projects of 12,500 tons compare with 33,265 tons last week and 10,825 tons two weeks ago. Among fresh inquiries are 2500 tons for a bridge across the Lake of the Ozarks in Missouri and 2800 tons for the Krebs Pigment & Color Co., Edge Moor, Del., which was previously reported as requiring 900 tons. Plate awards at 4600 tons include more than 3000 tons for the Standard Oil Co. of California. Structural steel lettings for the week follow:

NORTH ATLANTIC STATES

Hanover, N. H., 350 tons, State bridge, to American Bridge Co.

Plymouth, N. H., 250 tons, State bridge, to Lackawanna Steel Construction Co.

Natick, Mass., 175 tons, artillery storage shed, to Phoenix Bridge Co.

Lawrence, Mass., 990 tons, bridge, to Central Construction Co.

Groton, Conn., 810 tons, crane shed for Electric Boat Co., to American Bridge Co.

Coxsackie, N. Y., 205 tons, shop building, to Belmont Iron Works.

New York, 3400 tons, Pier 32 in Hudson River, to Taylor-Fichtor Steel Construction Co.; Jones & Laughlin Steel Co. will fabricate. Award subject to approval of loan.

Endicott, N. Y., 120 tons, school building, to Bethlehem Fabricators, Inc.

Rochester, N. Y., 1400 tons, Rundel Memorial Library, to F. L. Heughes & Co.

Hoosic Falls, N. Y., 240 tons, State highway bridge, to National Bridge Works.

Montoursville, Pa., 160 tons, highway bridge, to Lackawanna Steel Construction Co.

Curtis Bay, Md., 265 tons, power house, to McClintic-Marshall Corpn.

Washington, 295 tons, addition to Department of Interior building, to Fort Pitt Bridge Works Co.

Washington, 2025 tons, addition to Department of Internal Revenue building, to Fort Pitt Bridge Works Co.

THE SOUTH

Seaboard Airline, 870 tons, bridge over James River at Richmond, Va., to Virginia Bridge & Iron Co.

Lancaster, Ky., 270 tons, bridge, to Vincennes Bridge Co.

Mobile, Ala., 325 tons, bridge, to McClintic-Marshall Corpn.

CENTRAL STATES

Toledo, Ohio, 250 tons, sheet piling for Chesapeake & Ohio Railroad dock, to Empire Construction Co., Baltimore.

Toledo, 800 tons, car dumper for Chesapeake & Ohio Railroad, to Industrial Brownhoist Corpn.

Cincinnati, 110 tons, Mill Creek bridge, to American Bridge Co.

Chicago, 760 tons, city highway bridge, to Hansell-Elcock Foundry Co.

Milwaukee, 300 tons, sewage plant, to McClintic-Marshall Corpn.

State of Minnesota, bridge, 225 tons, to McClintic-Marshall Corpn.

State of Iowa, 500 tons, three bridges, to McClintic-Marshall Corpn.

WESTERN STATES

Eagle County, Colo., 275 tons, State overhead crossing, to an unnamed bidder.

Billings, Mont., 410 tons, bridge, to Minneapolis-Moline Power Implement Co.

Norwalk, Cal., 130 tons, school building, to Virginia Bridge & Iron Co., Inc.

Southern Pacific Co., 130 tons, bridge at San Jose, Cal., to American Bridge Co.

South San Francisco, 120 tons, school, to Golden Gate Iron Works.

Los Angeles, 220 tons, County bridge over Barham Boulevard, to Consolidated Steel Corpn.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Chelsea, Mass., 385 tons, bridge repairs.

Chelsea, Mass., 130 tons, Soldiers' Home.

Boston, 250 tons, I. J. Fox Co. building.

East View, N. Y., 500 tons, bridge for New York Central Railroad.

Delaware & Hudson Railroad, 150 tons, grade elimination at Windsor, N. Y.

East Rockaway, N. Y., 250 tons, high school building.

Ellis Island, N. Y., 150 tons, Immigration Building.

Penn's Grove, N. J., 225 tons, school; Belmont Iron Works, low bidder.

Edge Moor, Del., 2800 tons, buildings for Krebs Pigment & Color Co.; previously reported as 900 tons.

Washington, 200 tons, addition to Bowen Building.

Dover, Del., 680 tons of sheet steel piling, groins for Rehoboth Beach and Bethany Beach; bids taken by State highway department, Oct. 3.

CENTRAL STATES

Chicago, 400 tons, Atlas Brewing Co.

Niles Center, Ill., 625 tons, sanitary district.

Prophetstown, Ill., 500 tons, Rock River bridge.

Menomonie, Wis., 430 tons, three State highway spans; Worden-Allen Co., low bidder.

Menomonie, Wis., 225 tons, Lambs Creek bridge; Wisconsin Bridge & Iron Co., low bidder.

Augusta, Wis., 310 tons, State highway span; bids Oct. 16.

Prairie du Chien, Wis., 150 tons, Lynxville-DeSoto bridge; bids Oct. 16.

State of Missouri, 2500 tons, bridge over Lake of the Ozarks; bids Oct. 16, Sverdup & Parcel, St. Louis, engineers.

State of Nebraska, 460 tons, highway bridges at Brule and Roscoe.

WESTERN STATES

Sausalito, Cal., 400 tons sheet piling, yacht harbor, bids soon.

San Francisco, 800 tons, psychopathic cancer building; bids Oct. 24.

Seattle, 440 tons, Mount Diablo power plant; general contract awarded.

Grand Coulee Dam, Wash., 700 tons, highway bridge for Bureau of Reclamation.

Montesano, Wash., 260 tons, bridge.

Los Angeles, 1200 tons, second unit of Colorado River aqueduct; bids to be taken by Metropolitan Water District of Southern California, Oct. 31.

FABRICATED PLATE

AWARDS

Syracuse, N. Y., 275 tons, tanks for Tide Water Oil Co., to Hammond Iron Works.

Tremley Point, N. J., 585 tons, tanks for Sinclair Refining Co., to Chicago Bridge & Iron Works.

Kenosha, Wis., 390 tons, standpipe, to Graver Tank & Mfg. Corpn.

Madison, Wis., 250 tons, gas holders and tank covers for Nine Springs sewage treatment plant, to Graver Tank & Mfg. Corpn.

Richmond, Cal., 110 tons, two smoke stacks for Standard Oil Co., of California, to Berkeley Steel Construction Co.

Rio Bravo and Estero Bay, Cal., 3000 tons, 11 tanks for Standard Oil Co. of California; 1350 tons to Western Pipe & Steel Co. and 1650 tons to Consolidated Steel Corpn.

NEW PROJECTS

Lowell, Mass., 300 tons, three standpipes.

Fairport, Ohio, 100 tons, water tank and pipe line, Chicago Bridge & Iron Works, low bidder.

Los Angeles, 4000 tons, second unit of Colorado River aqueduct; bids to be taken by Metropolitan Water District of Southern California, Oct. 31.

Safety Progress In Steel Industry Cited

ACCIDENT fatality in the United States has decreased 31 per cent since the safety movement was organized, Donald B. Gillies, president, Corrigan, McKinney Steel Co., Cleveland, told the metals section of the National Safety Congress at its Cleveland convention. He commented especially on the pioneering work in the safety field which has been done in the steel industry.

"The United States Steel Corpn.," he said, "has achieved a noteworthy success in prevention of accidents. This organization has, during the past 27 years, reduced its serious and fatal accident rate some 57 per cent. That means about 72,000 men were saved, to say nothing of their respective families."

Mr. Gillies also said that in his own company accident prevention had resulted in a great saving of life and limb and of hundreds of thousands of dollars in wages which employees might otherwise have lost.

"Safety in industry," he said, "is a great human problem which obligates us to investigate every accident not for fault-finding purposes, but so that intelligent corrective measures may be applied which will prevent recurrence of similar accidents. Remedies must be formulated which will accomplish the desired results, whether through engineering, education or approved supervision."

Mr. Gillies stated that at the inception of the safety movement progress was slow because it was not thought essential to teach men the necessity of safety.

"Since then, however," he said, "management has learned that it must go further and workers must be educated in the safe ways of doing their jobs, and be taught to think of safety subconsciously during all their waking moments. As a result, workers, collectively and individually, are more cognizant of safety in their daily occupations than ever before. Furthermore, they realize the economic importance to their families and to their companies in avoiding accidents."

LAKE ERIE'S *Latest Offering*

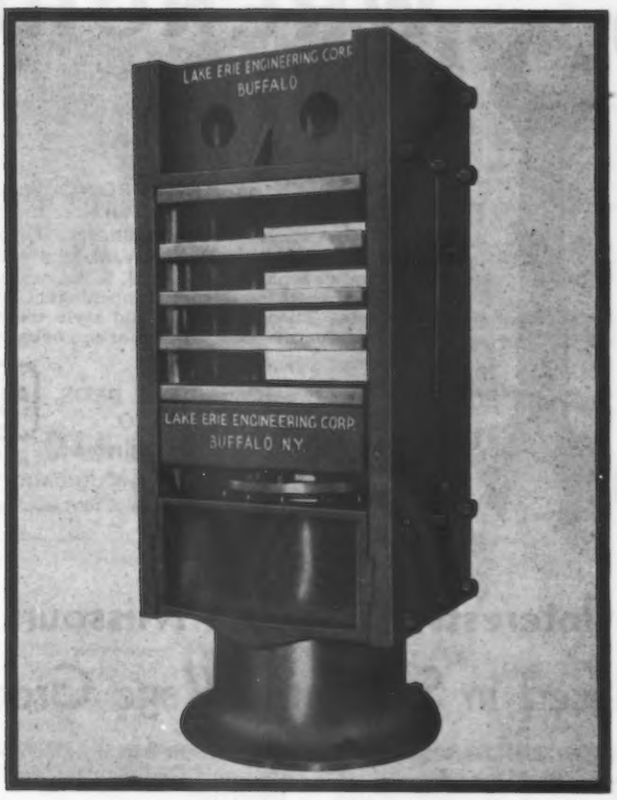

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Plate Frame Design
Gives Maximum Rigidity
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Assures Uniformity of Cure
Avoids Possibilities of Nuts Slackening
Improved Method of Hanging Platens

LAKE ERIE ENGINEERING CORP.

BUFFALO, N. Y.

Manufacturers Backing Industrial Truce Plea

THE issuance of a proclamation by President Roosevelt declaring a truce on industrial warfare during which the "status quo" of employment relations would be maintained, has been urged by the National Association of Manufacturers in a statement which challenges the American Federation of Labor to "bring forth a similar acceptance from its convention now in session."

At the same time the association states that "undoubtedly the public recognition by the President in his talk to the nation that recovery must be based upon the system of fair profit and through the process of individual initiative will be a helpful factor in supplying the confidence in the future which is essential for business progress."

Chicago Pneumatic Tool Co. has changed its Birmingham office location from South Second Avenue to 211 South Twentieth Street, where increased facilities for both sales and service activities are available. W. S. Lynch is manager of the Birmingham district office.

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STANDARDIZE on ARMSTRONG WRENCHES. They are made in 50 Types, in all sizes from tiny miniature wrenches to great forty pounders. They are made in special Carbon steel; chrome vanadium tool steel; in standard and new patterns; with U. S. American, S. A. E., Metric, Whitworth and special openings; singly or in matched sets. There is a type and style for every need but only one quality—*the finest that can be made.*

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Scrap Interests Ask That Missouri Be Placed in Southern Wage Group

WASHINGTON, Oct. 2.—A request to place Missouri in the list of Southern States under the scrap iron and steel, nonferrous and waste trade code was made at an NRA hearing today before Deputy Administrator J. J. Connolly.

Among those supporting a proposed amendment to the code to bring Missouri under the Southern group with lower wages were: Gus Gillerman of Gus Gillerman Co., representing the St. Louis chapter of the Scrap Iron and Steel Institute, and Benjamin Schwartz, New York, director of the institute and chairman of the code authority.

Mr. Schwartz termed the condition in Missouri as deplorable, pointing out that it is at present the lowest scrap iron market in the United States.

The Southern hourly wage is 27½c. for men and 22½c. for women. The North carries a differential 5c. per hour higher.

Another proposal included one sponsored by the code authority, which would revise the present section on wage readjustments above the minimum. Compensation for employees receiving wages above the minimum, according to the amendment, shall not be reduced from the rates existing on July 15, 1933, notwithstanding any reduction in working hours, and the payment for such employment would be increased by an equitable adjustment of all pay schedules.

Real Earnings Declined During August

CONTRARY to seasonal precedent the trend of manufacturing activity was downward in August of this year, according to data from 25 manufacturing industries that report to the National Industrial Conference Board.

The number of wage-earners employed in August was 1.6 per cent less than in July. Total man-hours worked declined 3.4 per cent and payrolls, 3.3 per cent.

Average hourly earnings were 58.8c. in August, as compared with 58.7c. in July, an increase of 0.2 per cent. The number of hours worked per week averaged 33.5 in August and 34.1 in July, a decrease of 1.8 per cent. The reduction in the average work-week resulted in lowering the average weekly pay per wage-earner from $19.92 in July to $19.59 in August, or 1.7 per cent, and an increase of 0.6 per cent in the cost of living during the same period decreased the purchasing power of the weekly pay envelope, so that real weekly earnings fell off 2.3 per cent.

The decline in manufacturing activity, as measured by total man-hours worked, was most marked in the foundries and automobile industry, in which the decrease amounted to 12 per cent and 10.8 per cent, respectively. Declines were noted in 19 of the 25 industries and in 10 of these the declines were more than 3.5 per cent. In 6 industries, on the other hand, total man-hours increased from July to August.

Australian Iron and Steel Output Rises

WASHINGTON, Oct. 2. — The marked increase in demand for iron and steel products in Australia during the past two years is reflected in figures just issued by the Broken Hill Proprietary Co., which during recent years has produced about 75 per cent of the Commonwealth's total output of pig iron and steel ingots, according to a report to the Department of Commerce from Assistant Trade Commissioner Wilson Flake, Sydney.

Production of pig iron by the Broken Hill Co., which decreased from 330,800 tons in the year ended May 31, 1929, to 153,563 tons in the year ended May 31, 1932, recovered to 262,714 tons during the year ended May 31, 1933, and expanded further to 346,752 tons in the year ended May 31, 1934, the Assistant Trade Commissioner reported.

The company's production of steel ingots, including the output of foundry open hearth furnaces, was 374,000 tons in the year ended May 31, 1929. The output dropped in the following year to 195,183 tons, but the improved demand for steel products brought the production figures up to 320,931 tons in the year ended May 31, 1933, and to 414,242 tons in the year ended May 31, 1934, the report stated.

Detroit Scrap Prices Unchanged

DETROIT, Oct. 2.—The local scrap market is quiet, with consumer buying almost at a standstill. Sentiment in the trade is a little more cheerful than a week ago. Prices are unchanged, but are largely nominal in the absence of major transactions.

Correction

CANADIAN imports of pipe, tubes and fittings during 1933 were incorrectly reported in tons rather than in dollar volume in THE IRON AGE, Sept. 13, page 82. The statistics were supplied by the Bureau of Foreign and Domestic Commerce, Department of Commerce, and all figures referred to should be dollars rather than tons.

Survey Shows Shortage Of Technical Engineers

THE need for more technical engineers in trade and industry was indicated in a survey conducted by American Engineering Council showing the distribution of engineers among the main industrial groups. The extreme low ratio of engineering employees in most of the groups shows that technological efficiency has only begun throughout most of our economic system.

Agriculture is at the bottom of the list with only one hundredth of one per cent of its workers engineers. Retail and wholesale trade comes next low with two hundredths of one per cent. Even the building and mining industries, which are becoming more extensively mechanized, are only in the magnitude of 0.64 per cent.

By contrast, at the top of the list, come the utilities with 3.51 per cent of employees professional engineers. Equipped to deal with its technical problems, the power business has steadily increased its efficiency so that in some years a substantial increase in national output is effected with an actual reduction in fuel consumption.

The following table suggests other fields wherein the employment of technical men will conserve natural resources, decrease consumer prices, and place weak units in a stronger competitive position:

Industry Group	Per Cent Engineers of Total Employment
A. Industries and trade	0.27
1. Iron, steel, machinery, and vehicles	0.70
2. Miscellaneous manufacturing industries	1.28
3. Other industries and trades	0.10
4. Chemical and allied industries	0.89
5. Trade (insurance, real estate, etc.)	0.20
6. Metal industries except iron and steel	0.50
7. Wholesale and retail trade	0.02
8. Food and allied industries	0.14
9. Printing and publishing	0.16
10. Clay, glass, and stone industries	0.34
11. Lumber and furniture industries	0.11
12. Textile and clothing industries	0.06
13. Leather belt and shoe factories; tanneries	0.04
B. Professional workers (per cent consulting and independent engineers)	1.84
C. Transportation	0.85
D. Government service	2.42
E. Building industry	0.64
F. Public utilities	3.51
G. Communication	2.30
H. Extractive industries (mining, oil wells, etc.)	0.67
I. Forestry and agriculture	0.01
Total (weighted average)	0.48

The above figures were made available by the U. S. Bureau of the Census on the basis of 1930 returns, the latest available, showing the spread of the profession under relatively normal conditions. For the first time, the total number of engineers in the United States has been determined in all the major professional groups. The total is 225,787 or 0.48 per cent of the 47,273,311 persons employed in April, 1930, under the industries employing engineers. The total number of engineers is sub-divided as follows:

Professional Group	Number	Per Cent
Civil engineers	101,946	45.12
Electrical engineers	57,735	25.56
Mechanical engineers	54,264	24.03
Mining engineers	8,408	3.75
Chemical and metallurgical engineers	3,434	1.54
Total	225,787	100.00

The growing number of engineers in government service is considered a significant trend. In 1930, 2.42 per cent of the total were employed by Federal, State and local governments. It is believed that, since the advent of the present Administration, the number has risen to at least 10 per cent, and at the height of the CWA program last winter may have been as high as 15 per cent. Additional numbers have been employed directly through public works contracts and other phases of the President's program.

Revere Copper & Brass, Inc., Michigan division, Detroit, has opened sales office at 922 Grand Rapids National Bank Building, Grand Rapids, Mich., in charge of David T. Applebee.

NON-SHRINK, OIL HARDENING

TOOL STEEL TUBING

The job of making ring dies, cutting dies, bushings spacers, etc., is half done when you start with Bissett Tool Steel Tubing. There is a size carried in stock to meet every requirement up to 12" O.D. and 2" wall thickness. Larger sizes can be supplied.

It eliminates forging, does away with annealing difficulties and cuts down machining cost.

We also supply special tubing to S.A.E. 52100 and S.A.E. 4615 analysis for Ball Bearing purposes.

Manufacturers of BISCO Tungsten Carbide and Tantalum Carbide drawing dies for wire, rod and tubing.

THE BISSETT STEEL COMPANY

Manufacturers of BISCO Tungsten Carbide drawing dies and cutting tools

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Cincinnati Philadelphia

Kohler Versus the Unions

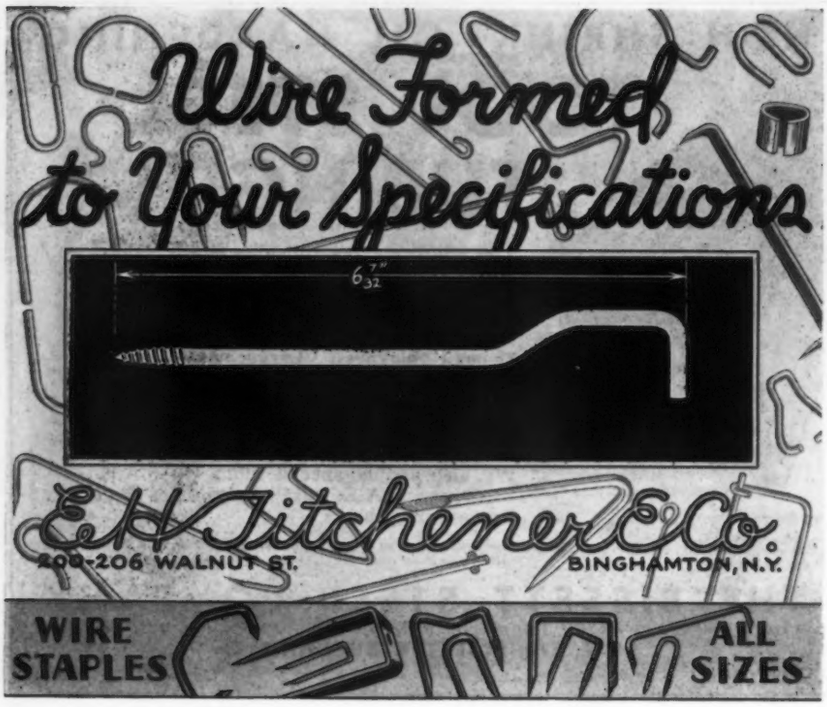
(Concluded from page 38F)

In further negotiations after this, through the Chicago Regional Labor Board, it was disclosed that the union demands for a 65 per cent increase in wages, shorter hours and other things were only bargaining points; that the only thing they really wanted was absolute domination by the union of all Kohler employees, although 1500 of them, more than 60 per cent of the total, had signed a petition declaring their desire to return to work under conditions prevailing before the strike started and demanding the protection of the public authorities to permit them to do so.

The Kohler Co. has stated a policy which should be followed by every intelligent employer in the country, and should be supported by an honest Administration, if this intensive and destructive drive toward dominance over 40 million workers by a small group of self-seeking agitators and fomenters of industrial warfare is to be stopped. It is this:

"Kohler Co. will not recognize the American Federation of Labor or any other organization as the representative of employees who do not wish to be represented by it, until or unless, the court of last resort tells us that we are mistaken in our reading of the law."

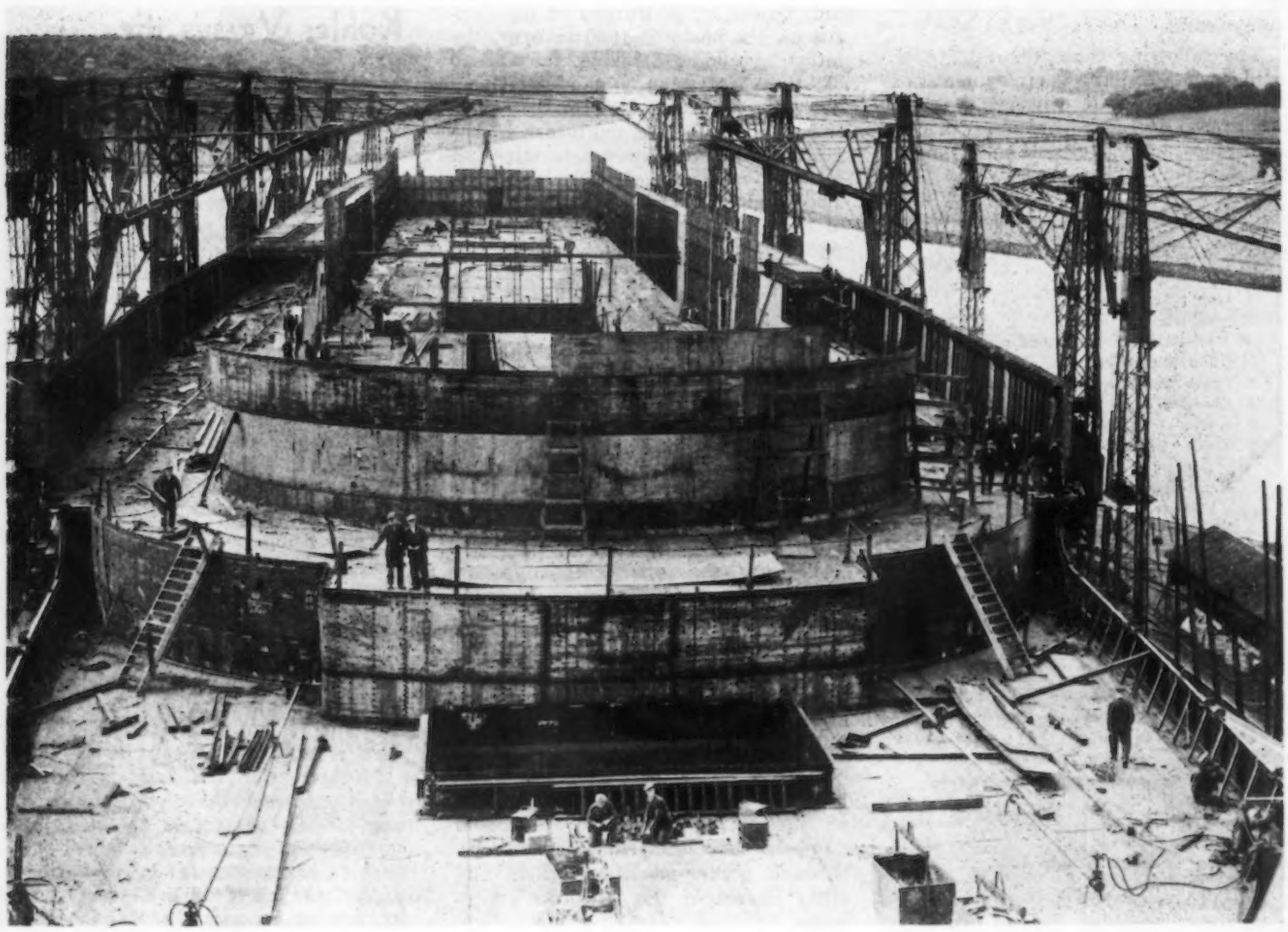
This is a slogan for American industry, for employees as well as employers, to follow which will lead this nation back to real prosperity.



Steel Plate Orders Rise in August

WASHINGTON, Oct. 2.—Orders for fabricated steel plate rose to 16,293 tons in August from 12,523 tons in July, according to the Bureau of the Census. In the eight-month period of the current year bookings totaled 167,649 tons, compared with 136,743 tons in the corresponding months of last year.

The Refrigerating Machinery Association will hold its annual meeting on Oct. 22, at the Stevens Hotel, Chicago. The association is rounding out a year of productive activity in the cooperative exchange of technical information, the standardization of equipment and the promotion of a high standard of trade practices. W. S. Shipley, 915 Southern Building, Washington, is president.



Largest British Liner, The Queen Mary, During Construction

General view, during construction, of the deck of the Cunard-White Star liner No. 534, launched last week as the Queen Mary. This ship when completed will be around 73,000 tons gross in size, with 11 decks and accommodations for 4,000 persons. It is more than 1,000 ft. long and will be equipped with geared turbines totaling more than 200,000 hp.

Steel Merger—1934 Style

(Concluded from Page 30)

size and shape from comparatively large rolled sections to the thinnest of bands.

In recent years Republic has secured outlets for its large bar-making potentialities by the acquisition of units for further processing. A subsidiary, the Union Drawn Steel Co., has an annual capacity of 360,000 tons of cold-finished steel bars, while the production of spikes, bolts and nuts in its own plants might take an additional 140,000 tons of Republic's bar mill products. The acquisition of Truscon will provide a further large outlet for bars for concrete reinforcement as well as flat-rolled products for many other purposes.

In addition to bars and sheets, Republic has a hot-rolled strip-making capacity of 800,000 tons, and with 3,000,000 tons of bars and 960,000 tons of sheets its production facilities for the three forms of steel, which in 1933 accounted for almost 50 per cent of total finished steel output, are very ample. These products also happen to be the major items consumed by the automotive industry, which took 19 per cent of last year's finished steel.

The tin mills of the N. & G. Taylor Co., a Corrigan, McKinney subsidiary, have a capacity of 680,000 base boxes annually. This would raise Republic's tin plate capacity to nearly 3,000,000 boxes yearly. In 1933 tin plate accounted for nearly 11 per cent of finished steel output.

Republic's position in the alloy steel industry would not be altered by the proposed merger. The company's electric furnace capacity is 120,000 tons annually, or approximately 13½ per cent of the country's total. It is the largest single producer of alloy steels, and probably of stainless steels, even though definite figures on production of the latter material are not available. Its future marketing possibilities in the alloy and stainless field are naturally dwelt upon heavily by proponents of the projected merger. The advantages to Corrigan, McKinney stockholders in sharing this potential market are obvious. The personnel of the Republic company is going to considerable lengths in acquainting the stockholders with the prospects for future profits in alloy steel. It is rather generally known that consumption of alloy steels during the depression has declined much less relatively than the use of ordinary carbon steels. This is particularly true of stainless steel, which is coming into growing favor in many important industries, including meat packing, food, oil refining, brewing and distilling, automotive, textile and tobacco-making.

The automotive industry is the principal outlet for alloy steels, although the agricultural implement and machinery-making groups are rapidly increasing their takings.

Whether or not a sufficient number of Republic stockholders approve the proposed financial changes and the acquisition of Corrigan, McKinney and Truscon, they will at least have had an opportunity of finding out more about their company than has been offered to security holders in the majority of mergers in the past.

GET THIS DATA . . .

We will send it gratis. It tells how the average plant can save as much as $5000 per year in Power Costs by use of the Modernized Group Drive. You will find it worth having because it will give you some new ideas on savings you can make in your power transmission costs—savings of as much as 46 per cent, and more. Some of them may be directly applicable to your plant. SEND FOR IT . . . .

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SCHIEREN-IZING makes leather belting pliable

Streamline Passenger Coaches Arc Welded

(Concluded from Page 37)

side face. These welds are continuous for the length of the pan.

The typical automatic weld used in side pans is shown in Fig. 3.

After the pan corners are filled in with a deposit of weld metal, and after the temporary bolts are removed, the side structure is turned over and the flanges are spot welded to one another.

In Fig. 4 can be seen one of the sides of a coach being welded manually at the flange ends.

The window frames are fabricated from 12-gage steel, pressed into U-shaped contours. Flanges project inwardly to coincide with the window construction.

Construction of the turtle-back roof consists of 1/16-in. steel sheets pressed into pans flanged on all four sides and also 3/16-in. pressed side plates. Steel strips ⅛ in. by 3 in., welded between the center pan flanges, form the ridge pole.

In welding the roof pans, a strip projects above the surface of the pans and the carbon arc used in the automatic welding melts the strip down, thus providing filler metal between the flanges. The typical weld employed in construction of the roof is shown in Fig. 5. Automatic welding of the roof is shown in Fig. 6.

The smooth external appearance of the coach shown in Fig. 1 results from the smooth, even bead deposited by the automatic welding and by a system of water cooling which minimizes warpage. This water cooling system consists of an arrangement of drilled pipes in connection with the welding jig. Located under the material being welded, these pipes provide a continuous spray of cold water upon the under side of a joint while it is being welded. This method of cooling is sufficiently effective to permit placing the bare hand on the weld within 5 in. of the arc. Due to the fact that heat was prevented from penetrating into the flat surfaces of the pans, warping was reduced to a minimum.

No grinding was necessary in finishing the automatic welds. The manual welds were ground down as needed. Welding equipment, including the Electronic Tornado automatic welder and the manual welding machine as well as electrodes, was supplied by the Lincoln Electric Co., Cleveland. The illustrations were also furnished by that company.

PLANT EXPANSION AND EQUIPMENT BUYING

Inquiries Increase But Tool Demand Is Slow

THE machine tool market continues at the same slow pace that has characterized the activity for some weeks. Tools of various types and sizes are being sold, but the bulk is still missing in total orders. Requests for retooling recommendations have reached such proportions in many offices as to contribute a new feature to the market background. These however have, as yet, been no more productive of new business than the regular flow of inquiry.

Apparent settlement of textile labor difficulties has tended to ease doubt tension in the market. Of course, business still is harried over the future course of NRA and is inclined to blame a larger amount of business uncertainty on Washington.

NEW ENGLAND

Taunton-New Bedford Copper Co., North Front Street, New Bedford, Mass., is considering one-story copper and brass plate works.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 12 for seamless steel tubing for Boston, Philadelphia and other navy yards (Schedule 3413).

Quebec Extension Railway, Quebec, plans new electrified railroad from Washburn, Me., to Lac Frontier, on Canadian boundary line, about 90 miles. Cost $4,168,000 with equipment. Financing is being arranged, in part through United States Federal aid. Line will later be extended for connection between Bangor & Aroostook Railway and Canadian National Railways, about 22 miles.

Essex Die Co., Lynn, Mass., has been organized by Harry Kimball, 6 Beede Avenue, and associates, to manufacture dies and kindred products.

Board of Education, Hamden, Conn., plans installation of machine shop for manual training in new multi-story high school, for which general contract has just been let to Industrial Construction Co., 721 Main Street, Hartford, Conn. Cost about $700,000. R. W. Foote, New Haven, Conn., is architect.

New England Alcohol Co., Everett, Mass., has taken out permit for one and two-story plant building, 60 x 72 ft. Cost close to $40,000 with equipment.

Commanding Officer, Springfield Armory, Springfield, Mass., asks bids until Oct. 8 for spare part chests and accessories for Browning machine guns (Circular 20).

NORTH ATLANTIC

Continental Can Co., 1 Pershing Square, New York, plans three-story addition, 60 x 82 ft., at branch plant, Houston, Tex., for storage and distribution, with new train shed, 70 x 200 ft., loading platform, etc. Cost over $100,000 with mechanical-handling and other equipment. R. J. Cummins, Bankers' Mortgage Building, Houston, is consulting engineer.

Public Fuel Service, Inc., 5 West 144th Street, New York, has filed plans for two-story coal pocket, with conveying, loading and other facilities. A. M. Brothers is company architect.

General American Tank Storage & Terminal Co., 122 East Forty-second Street, New York, gasoline, oils, etc., has acquired property adjoining bulk storage and distribution terminal at Corpus Christi, Tex., and plans addition with installation of steel tanks, pumping equipment, etc. Company has also purchased for expansion terminal formerly owned by Pure Oil Co., on local waterfront, as well as similar property recently acquired at Westwego, La., where additional facilities will be installed.

Board of Education, Putnam Valley, N. Y., plans manual training department in new multi-story school. Fund of $375,000 is being arranged through Federal aid. Bids will be asked in 60 to 90 days. A. F. Gilbert, 358 Fifth Avenue, New York, is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 9 for 300 half masts and 1000 filters (Schedule 3434), 702 water-gage glass fittings (Schedule 3412), welders' helmets, goggle frames, goggles, etc. (Schedule 3442).

Griffin Wellpoint Corpn., New York, has been organized by Timothy G. and Francis D. Griffin, 60 East Forty-second Street, and associates, to manufacture pumping machinery, well equipment, parts, etc.

Village Board of Trustees, Woodridge, N. Y., Philip Baker, clerk, asks bids until Oct. 10 for new sewage treatment works, including sludge equipment, pumping machinery, etc. Abraham H. Okun, 79 High Street, Monticello, N. Y., is consulting engineer.

Board of Education, Lambertville, N. J., plans new manual arts course at local high school, with installation of shop equipment and facilities. E. J. Guest is supervising principal.

Colville Container Corpn., Wayne Township, Wayne, N. J., has been organized by Albert R. Colville, Wayne Township, and associates, to manufacture steel drums and other metal containers.

Commanding Officer, Picatinny Arsenal, Dover, N. J., asks bids until Oct. 10 for seamless tube, forged nose 300-lb. demolition bombs, complete with rear caps, lock nuts, etc. (Circularly 48).

General American Tank Storage & Terminal Co., Lafayette Street, Carteret, N. J., oil and gasoline products, has taken options on 6-acre tract adjoining plant and plans expansion, including six large steel tanks and other storage and distribution equipment. Headquarters are at 122 East Forty-second Street, New York.

Seacoast Refining Co., Jacobus Avenue, Kearny, N. J., oil products, plans rebuilding part of plant recently destroyed by fire. Loss close to $40,000 with tanks and equipment.

Publicker Commercial Alcohol Co., 260 South Broad Street, Philadelphia, has acquired six acre tract adjoining plant at Bigler Street and Delaware Avenue, and plans large addition. Cost over $150,000 with equipment.

Commanding Officer, Frankford Arsenal, Philadelphia, asks bids until Oct. 8 for 14 sets instruments for anti-aircraft guns (Circular 95).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 12 for 731 gun mount adapters, 831 ejected case containers, 731 ejected link containers, sight mounts, sight mounting brackets, etc. (Schedule 3399); until Oct. 9, gasoline engine-driven air compressor (Schedule 3409); until Oct. 16, 300 aircraft turn and bank indicators (Schedule 3423) for Philadelphia Navy Yard; until Oct. 16, 14,000 lubricating-system fittings (Schedule 3417) for Philadelphia and Puget Sound yards.

BUFFALO DISTRICT

Binghamton Metal Forms, Inc., Binghamton, N. Y., has been organized by Herman A. Speh, 13 Murray Street, and Matthew G. Schneider, 51½ Davis Street, to manufacture special metal products.

Pauly's, Inc., Buffalo, has been organized by H. E. Pauly, 17 Hawkins Avenue, Hamburg, N. Y., and associates, to manufacture lighting fixtures and equipment.

OHIO AND INDIANA

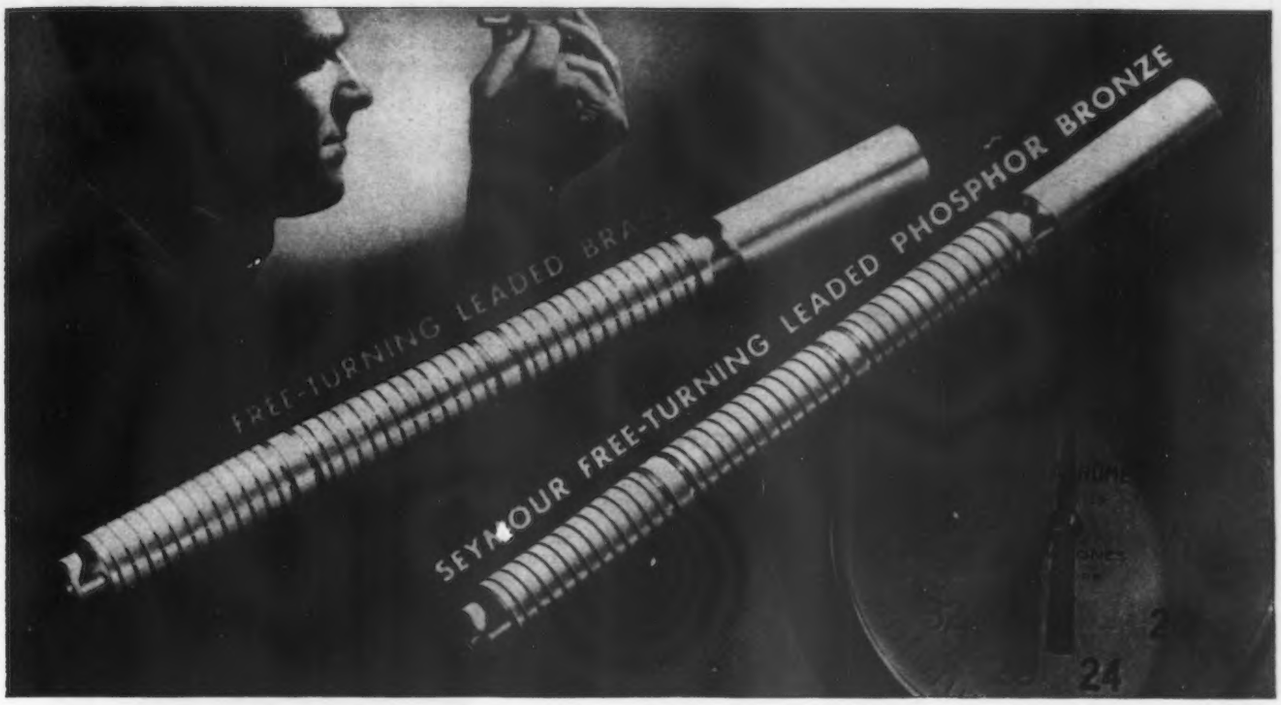
W. Kottler & Son, Inc., 5911 Lexington Avenue, Cleveland, manufacturer of copper, tin and other metal products, plans one-story shop addition, 40 x 56 ft.

Washtak Machine Co., Cleveland, has been organized by Anthony L. Washtak, 6601 Union Street, and associates, to manufacture machinery and parts.

Gulf Refining Co., Seventh and Grant Streets, Pittsburgh, has plans for new bulk oil storage and distributing plant at Cincinnati, including main two-story building and several one-story units, boiler house, tanks, etc. Cost over $100,000 with equipment. Department will be installed for lubricating oils.

Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Oct. 10 for construction and installation of alumilite process or equivalent for treating aluminum and aluminum alloys (Circular 149), 26,000 ft. flexible heater cord (Circular 145); until Oct. 9, upper and lower panel assemblies, vibrator, and thermometer test panel assemblies (Circular 137); until Oct. 16, 20 engine ring cowling assemblies (Circular 151), 50 sets filter units (Circular 138); until Oct. 18, eight stereoscope assemblies (Circular 146), 150 antenna supports and 450 radio fixed antenna (Circular 144); until Nov. 1, basic training airplanes (Circular 15).

Kroger Grocery & Baking Co., 35 East Seventh Street, Cincinnati, has let general contract to Penker Construction Co., 1030 Summer Street, for two-story and basement



Gauging the Stride of Phosphor Bronze!

HAVE you ever wanted to specify Phosphor Bronze for screw machine work because of its many excellent qualities, but have abandoned it on the score of workability? Then you will be interested in the following account of the performance of Seymour free-turning, leaded Phosphor Bronze . . . . the bronze which has broken away from tradition.

One of our customers happened to be in production on the brass radio condenser shafts illustrated above. Knowing that leaded brass would be accepted as a standard for easy workability, we asked our friend to change over to Seymour Phosphor Bronze, but *without altering set-up, tools or speed.* He did so, and the resulting shafts were exact duplicates of the brass.

With a shaft length of 4⅞", offering plenty of "give," this meant something; for the slots had to be held to .0005 and the diameter at the bottom of the slots to .001, plus or minus.

Let us be definite, however. This test was not made to depreciate brass, but rather to show by the workability of brass that Seymour Phosphor Bronze has been keeping pace with the times.

Therefore, if you require a stock that will resist corrosion, remain practically constant under thermal change, refuse to spark when struck or "arc" when charged, and withstand severe "fatigue" — and still have good production possibilities—try Seymour Phosphor Bronze. Samples will be submitted if you wish them.

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SEYMOUR
SHEETS, WIRE, RODS

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ALSO: NICKEL SILVER SHEETS, WIRE, RODS : AND NICKEL ANODES

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A HELPFUL CATALOG

Many pages in the Perkins 102 page catalog contain tables and gear calculation data. Mechanical executives and designers find this catalog extremely useful.

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PERKINS MACHINE & GEAR CO.

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meat-packing and processing plant, 150 x 200 ft. Cost about $400,000 with equipment. Tietig & Lee, 34 West Sixth Street, are architects.

Bluffton Foundry & Machine Co., Inc., 602 West Washington Street, Bluffton, Ind., has been organized by Fred Moser and George Lautzenheiser, address noted, to operate a general foundry and machine works.

WESTERN PENNA.

Schenley Distillers Corpn., Schenley, Pa., has let general contract to Frank Messer & Sons, Inc., 2515 Burnet Avenue, Cincinnati, for eight-story storage and distributing building at distillery, Lawrenceburg, Ind., 150 x 150 ft. Cost about $150,000 with equipment. Joseph S. Finch & Co., Inc., Schenley, an affiliated organization, has let contract to same company for similar multi-story storage and distributing building at Schenley plant. Cost $150,000 with equipment. Headquarters are at 20 West Fortieth Street, New York. Carl J. Kiefer, Schmidt Building, Cincinnati, is engineer for both projects.

United States Engineer Office, Huntington, W. Va., asks bids until Oct. 9 for one steel mitering lock gate, two leaves, completely assembled, for Lock No. 2 (Circular 84); until Oct. 10, three clam shell and one orange peel buckets (Circular 89).

City Council, New Castle, Pa., is arranging for bond issue of $3,750,000 for new municipal electric light and power plant, including distribution lines. Mayor Charles B. Mayne is in charge.

WASHINGTON DISTRICT

General Purchasing Officer, Panama Canal, Washington, asks bids until Oct. 11 for one 1-cu. yd. clamshell bucket, two sets teeth; 1-cu. yd. orange peel bucket; 18,144 flashlight batteries, flashlights, electric storage batteries, 100 electric water heaters, anchor shackles, 432 hand shovels, 4000 lb. nails, 1000 casting brushes and other equipment (Schedule 2999).

Chevrolet Motor Co., 3044 West Grand Boulevard, Detroit, has asked bids on general contract for main units of new branch assembling plant in Canton industrial district, Baltimore, where 45-acre tract has been acquired. Plant will consist of main one and one-half story shop, 600 x 980 ft.; service building, 85 x 245 ft.; storage and distribution building, 50 x 315 ft.; power house, office building and other units. Part of plant will be occupied by Fisher Body Corpn., affiliated organization, for automobile body production. Cost over $700,000 with equipment. Albert Kahn, Inc., Detroit, is architect and engineer.

General Textile Mills, Inc., Fredericksburg, Va., is planning to rebuild part of plant recently destroyed by fire. Loss over $100,000 with machinery.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 9 for burrs, rivets and washers (Schedule 3389), coil chain and weldless chain (Schedule 3396), pumps (Schedule 3298); until Oct. 12, nails, tacks and spikes (Schedule 3398) for Eastern and Western yards.

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for new seaplane hangar, Naval Fleet Air Base, Pearl Harbor, T. H. (Specification 7770).

SOUTHWEST

Quality Foundry Co., Independence, Kan., C. A. Salisbury, head, plans new one-story foundry, 30 x 75 ft.

Southern Cotton Oil Co., Little Rock, Ark., plans rebuilding part of plant recently destroyed by fire. Loss over $75,000 with equipment. Main offices are in Canal Bank Building, New Orlean

United States Engineer Office, Postal Telegraph Building, Kansas City, Mo., asks bids until Oct. 8 for two feed water heaters (Circular 131); until Oct. 9, one gas calorimeter, air pump, pressure gage, etc. (Circular 132); until Oct. 10, machine bolts, carriage bolts, drift bolts, nails, spikes, nuts, washers, steel plates, etc. (Circular 133).

Straughan Aircraft Corpn., Wichita, Kan., manufacturer of airplanes and parts, has been acquired by new interests, headed by Mark Kleedon, head of Black Gold Refining Co., Oklahoma City, Okla. Plant will be removed to last noted place, where expansion will be carried out. Cost about $50,000 with equipment.

Board of Education, Library Building, Kansas City, Mo., plans early call for bids for new three-story and basement mechanical shop and equipment building. Cost over $100,000 with equipment. Charles A. Smith, Finance Building, is architect.

Common Council, Wells, Tex., will take bids soon for equipment for municipal waterworks, including pumping machinery, elevated steel tank and tower, pipe lines, etc. Joseph Rady, Majestic Building, Fort Worth, Tex., is consulting engineer.

Owl Radiator Works, San Antonio, Tex., has been organized by J. L. Kercheville, Brady Building, and associates, to manufacture automobile radiators and kindred sheet metal products.

Board of Directors, Cameron County Water Improvement District No. 19, Harlingen, Tex., Keith McCanse, president, plans electric-operated pumping plant on Rio Grande River, in connection with irrigation project, including two 30-in. pumping units and accessories. Bonds for $471,000 have been arranged for entire project. A. Tamm is engineer.

Shampaine Aseptic Steel Furniture Co., 1007-12 Russell Avenue, St. Louis, manufacturer of steel surgical furniture, has leased 10,000 sq. ft. of additional floor space, doubling that now occupied.

Alco Valve Co., 2628 Big Bend Boulevard, Maplewood, Mo., is erecting one-story and part basement addition, to cost $25,000 including equipment.

Shell Petroleum Corpn., St. Louis, plans erection of a new pumping plant for booster service along its crude oil pipe line near Jennings, La. Cost $45,000 with equipment.

MICHIGAN DISTRICT

Kent Refining Co., Grand Rapids, Mich., plans new oil refinery near Grand Haven, Mich. Cost about $55,000 with equipment.

Basshead Ale & Brewing Co., Port Huron, Mich., recently organized, has engaged Giffels & Vallet, Inc., Marquette Building, Detroit, architect and engineer, to prepare plans for new plant, including remodeling of building formerly occupied by Albert B. Parfet Co., and new units. Cost close to $100,000 with equipment.

Jackson Aircraft Corpn., Jackson, Mich., has been organized by Fred Redman, 751 West Franklin Street, and associates, to manufacture airplanes and parts.

Alma Mfg. Co., Alma, Mich., manufacturer of automotive equipment, motor truck chassis, etc., has taken option on plant of Welch-Wilmarth Corpn., Sparta, Mich., for branch plant for production of automobile house-trailers, parts, etc.

SOUTH CENTRAL

United States Engineer Office, Vicksburg, Miss. (P. O. Box 667), asks bids until Oct. 8 for copper wire, electric conduit, rubber insulated cable, etc. (Circular 74).

Kilby Car & Foundry Co., Anniston, Ala., manufacturer of car wheels, axles, etc., has approved plans for expansion for steel casting production. Contract for electric steel furnace has been let and awards for other equipment will soon be made. Cost about $100,000.

Board of Education, Starkville, Miss., plans new vocational training school, with mechanical shop unit and other departments. Fund of $72,000 is being arranged for building and equipment.

Common Council, Algood, Tenn., plans early call for bids for equipment for waterworks improvements, including pumping machinery, pipe lines, etc. J. E. Switzer, Engineering Building, Knoxville, Tenn., is consulting engineer.

Fisher Body Corpn., Detroit, has purchased plant of Kelsey Wheel Co., Memphis, Tenn., manufacturer of automobile wheels, etc., exclusive of equipment, and will occupy for new branch works.

Eberman Ice Co., Morgantown, Ky., is planning installation of boiler unit, Diesel engine, compressor and accessory equipment.

SOUTH ATLANTIC

Spearman Brewing Co., Pensacola, Fla., has let general contract to C. A. Fulghum, Pensacola, for new three-story and basement plant. Cost about $200,000 with equipment. Guy H. Spearman, head of Crystal Ice Co., city, is president. Richard Griesser, 64 West Randolph Street, Chicago, is architect.

Board of Greenwood County Commissioners, Greenwood, S. C., is securing authority from Federal Power Commission for new hydro-electric generating plant at Buzzard's Roost, Saluda River, for which Federal aid for $2,767,000 has been allotted. Project will include power substations, switching stations, transmission and distribution lines for power service in three counties. Chief Engineer Duncan, Greenwood County, is in charge.

Board of Town Commissioners, Carolina Beach, N. C., care of Norman L. Mintz, town clerk, 605 South Sixteenth Street, Wilmington, N. C., asks bids until Oct. 12 for deep-well pumping machinery and accessories, 100,000-gal. steel tank and tower, pipe lines, fittings,

(Continued on Page 74)

COOK SPRING CO • DIV • ANN ARBOR, MICH.

DETROIT • DIV • 6400 MILLER AVENUE

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SPRING SERVICE

SPRINGS in great variety
for every purpose . . .

EXTENSION • COMPRESSION • TORSION

PROMPT DELIVERY

FLAT-DIE SPRINGS • WIRE FORMS • STAMPINGS
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DETROIT AND ANN ARBOR, MICHIGAN

WITHIN THIS SPREAD-BETWEEN THE POWER AND THE

"YOUNG MAN, YOU'VE PUT YOUR FINGER ON A COST-REDUCTION I NEVER THOUGHT OF"

"WE shall have to sell over seven million yards of additional production to make up for *just the carrying charges* on the difference in cost between these two methods of transmitting power to our machines." Thus a textile head summed-up the problem.

In a metal-working plant, additional production to the value of 7 per cent of the entire machine investment had to be sold to offset *carrying charges alone* on the difference in cost between the Unit and Group methods of applying motor power to the work.

In nearly every plant throughout industry there are machines and departments that call for Unit Drive (individual motors) and there are machines and departments that demand Group Drive (one motor for a group of machines). Either method of getting the motor power to the work is right when, and only when, it is correctly applied. Both methods are rarely right for the same set of conditions.

On the right choice rests a production cost factor that cannot be ignored. A study of the production requirements of the plant or the department is usually necessary for a sound recommendation. This is the work of power or transmission engineers.

But any executive can quickly see the cost-

WORK—IS A SOURCE OF PROFIT IN MANY PLANTS . . .

penalty involved in using Unit Drive instead of Group Drive where the latter is equally or more efficient. Essentially, the question is one of a correct use and application of motor power (see graphs at right).

Unit Drive with small high-cost motors meets certain conditions within or throughout a plant. But there are many conditions under which modern Group Drive, using larger and more heavily loaded motors, will not only substantially reduce the investment cost per installed horsepower but reduce maintenance and power costs as well.

An answer to the question of how to reduce costs is usually found through correction or modernization of power and transmission equipment. You may approach the question by making this inquiry: "Is there a source of profit in *our* plant between the power and the work?" or you might very profitably send for and read our Red Book which is "A practical analysis of some fundamentals of Industrial Power Transmission." Write for it today.

POWER TRANSMISSION COUNCIL
(Sponsored by Mechanical Power Engineering Associates)
An association of producers and distributors of power, power units and mechanical equipment for the transmission of power.
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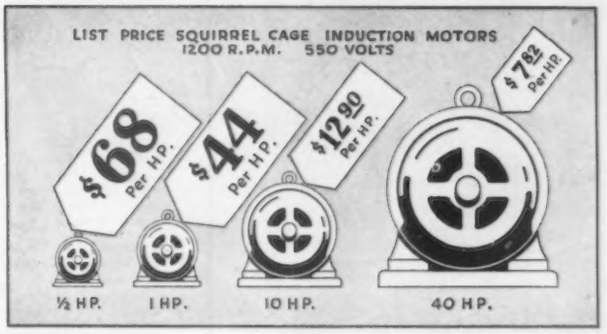
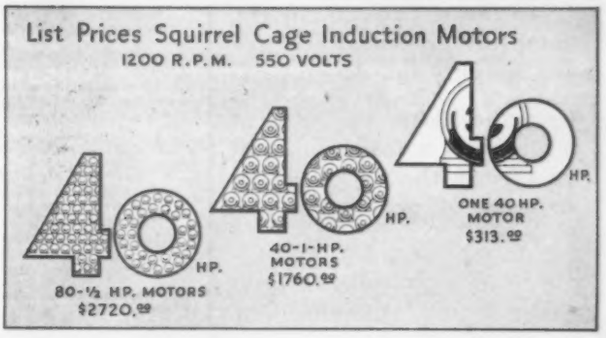
Power Transmission Clubs have been organized in key industrial cities to render constructive service to customers. Their number is growing. Members are qualified to render constructive service as a result of study of supplied case information as well as local plant problems.

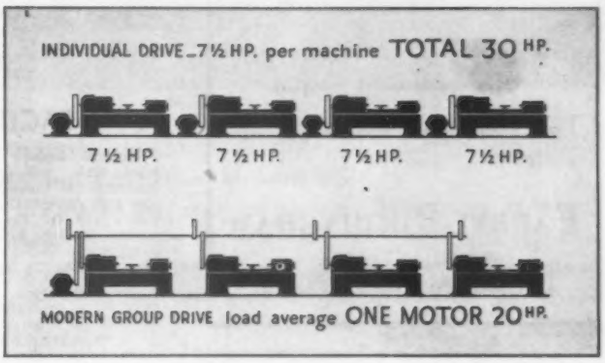
For example, consider the price of horsepower.



Then consider how the use of small motors affects your total horsepower investment.



Now see how much horsepower you actually need for a 20-horsepower job.



Case studies have been made in a number of plants showing detailed costs of group drives, or combinations of group and unit drives, compared with the cost of a unit drive on each machine. These case studies, available on request, report the actual findings of power transmission engineers working with the manufacturers' own plant officials, engineers and accountants.

A POWER DOLLAR SAVED IS A PROFIT DOLLAR EARNED

NO OVERHEAD DRIVE

No. 10-10 Rafter Press-Brake; 100 tons maximum capacity, 10' 6" clear space between connecting links, 12' 8" die space.

In the Rafter Press-Brake the drive is in the base of the machine, instead of on top as in other press-brakes. The result is to lower overall height, lessen the headroom required and simplify the design.

Only the Rafter has no overhead drive, a feature that at once paves the way to a new standard of press-brake performance.

The Rafter Press-Brake overcomes former difficulties encountered in securing maximum output with maximum accuracy . . . it minimizes deflection, eliminates weaving and side-thrust, reduces rejects to a minimum and gives substantially increased output.

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FARREL-BIRMINGHAM
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etc., for municipal waterworks. J. L. Becton, Wilmington, is consulting engineer.

Daugherty Sheet Metal Works, Charlotte, N. C., has acquired sheet metal division of J. N. McCausland & Co., city, and will consolidate, expanding capacity.

MIDDLE WEST

Acme Steel Co., 2840 South Archer Avenue, Chicago, manufacturer of steel bands, strips, box strapping, etc., has let general contract to Lundoff-Bicknell Co., 100 North La Salle Street, for two-story addition to plant at Riverdale, Ill., 90 x 575 ft., in part for storage and distribution. Cost over $200,000 with equipment.

Hollup Corpn., 3333 West Forty-eighth Place, Chicago, manufacturer of welding rods and kindred equipment, has awarded general contract to A. T. Herlin & Son, 6816 Clyde Avenue, for one-story addition, 128 x 191 ft. Cost over $40,000 with equipment. A. Epstein, 2001 West Pershing Road, is architect and engineer.

Constructing Quartermaster, Fort Snelling, Minn., asks bids (no closing date stated) for new one-story equipment storage and distribution building.

Common Council, Fairfax, Minn., has engaged G. M. Orr & Co., Baker Building, Minneapolis, consulting engineers, to prepare plans for new municipal electric light and power plant, using Diesel engine-generating unit. Fund of $50,000 has been arranged.

George Kunz Brewing Co., LaCrosse, Wis., Theodore J. Molzahn, president, is considering one-story mechanical bottling works. Cost about $40,000 with machinery.

Arora Corpn., 201 East Ohio Street, Chicago, has been organized by Leonard S. Miller and Russell Wiles, Jr., to manufacture electrical signs and displays.

White Eagle Oil Corpn., Federal Bank Building, Kansas City, Mo., will soon begin construction of two and three-story bulk oil storage and distributing plant, 134 x 137 ft., at St. Paul, Minn. Cost about $59,000 with equipment.

American Envelope Co., West Carrollton, Ohio, manufacturer of commercial envelopes, has leased 20,000 sq. ft. floor space in building at 2626 West Washington Boulevard, Chicago, for branch paper converting plant. James F. Lee will be factory manager.

FOREIGN

City Council, Johannesburg, South Africa, asks bids until Oct. 25 for equipment for municipal artificial gas plant, including carbonizing apparatus, retorts, etc.

Soviet Russian Government, Moscow, plans new steam power plant for central steam heating in local Stalin and Frunze districts, including pipe lines and distribution equipment. Cost over $1,500,000 with machinery. Amtorg Trading Corpn., 261 Fifth Avenue, New York, is official buying agency.

Cardiff Corpn., Cardiff, England, operating electric light and power properties, plans new electric generating plant for power supply for iron and steel works of Guest, Keen, Baldwins, Ltd., East Moors, Cardiff, now being expanded and improved. New station will cost over $300,000 with equipment.

Canadian Industries, Ltd., Beaver Hall Hill, Montreal, Que., manufacturer of industrial chemicals, etc., has let general contract to Fraser-Brace Engineering Co., Ltd., 107 Craig Street, for one-story addition. Cost close to $100,000 with equipment.

Thames Board Mills, Ltd., Purfleet, Essex, England, manufacturer of paperboard, cardboard and kindred products, affiliated with Unilever, Ltd., same place, is arranging for purchase of property at Manchester, England, for new mill, with power house, machine shop and other mechanical departments. Cost over $300,000 with machinery.

PACIFIC COAST

Upland Lemon Growers' Association, Upland, Cal., will soon take bids on general contract for one-story L-shaped packing, storage and distributing plant, 315 x 245 ft., and 100 x 110 ft. Cost about $100,000 with conveyors, loaders and other mechanical-handling equipment. W. W. Ache, 1616 Fourth Avenue, Los Angeles, is architect.

Grace Brothers, Santa Rosa, Cal., brewers, have plans for three-story brew-house addition, 40 x 45 ft. Cost over $50,000 with equipment. L. H. Nishkian, 525 Market Street, San Francisco, is consulting engineer.

Bureau of Reclamation, Denver, asks bids until Oct. 15 for three 1000-kva., 13 200-kva., nine 100-kva., four 5-kva. oil-insulated, self-cooled electric transformers for Boulder Dam power plant, Boulder Canyon Project, California-Arizona (Specification 592).

City Council, Ontario, Ore., C. F. Trow, city clerk, asks bids until Oct. 17 for water pumping and sludge pumping machinery, air blower, clarifier tank equipment, chemical feeders, flocculator equipment, pipe lines, etc., for new municipal water filtration plant.

Modesto Irrigation District, 823 Eleventh Street, Modesto, C. S. Abbott, secretary, asks bids until Oct. 8 for high-voltage transformers (Specification E-20), and feeder voltage regulators (Specification E-21). Special election has been called on Oct. 9 to vote bonds for $60,000 for new transmission line.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 12 for two single-gear cargo winches and one set spare parts (Schedule 3429); until Oct. 16 for 23,000 lb. medium steel plate (Schedule 3439) for Mare Island Navy Yard.

Board of Education, Santa Ana, Cal., has plans for one-story vocational training shop at Julia Lathrop junior high school. Cost about $25,000 with tools and equipment. Frederick H. Eley, 109 Orange Avenue, is architect.

Engineering Division, Municipal Light Department, County-City Building, Seattle, asks bids until Oct. 11 for electric equipment for Diablo municipal power project, including oil circuit breakers, disconnecting switches, oil purifying and testing equipment, hydraulic metering equipment, switch-gear, distribution panels and cabinets, rectifier equipment for switch operation, main unit instrument transformers and accessory equipment.

Frank Statement Needed To Stimulate Machine Tools

THE course of the machine tool industry during the fall and winter will depend largely upon the Administration's attitude with respect to monetary stability and regulation of business, Philip E. Bliss, president of the Warner & Swasey Co., Cleveland machine tool manufacturers, stated.

"If the Administration will make a frank statement defining and limiting the extent to which deflation of the dollar may be expected, and assuring corporations that they are not to be unduly restricted in their efforts to make a profit, we may expect an immediate rise in machine tool sales, reflecting a similar improvement in general business.

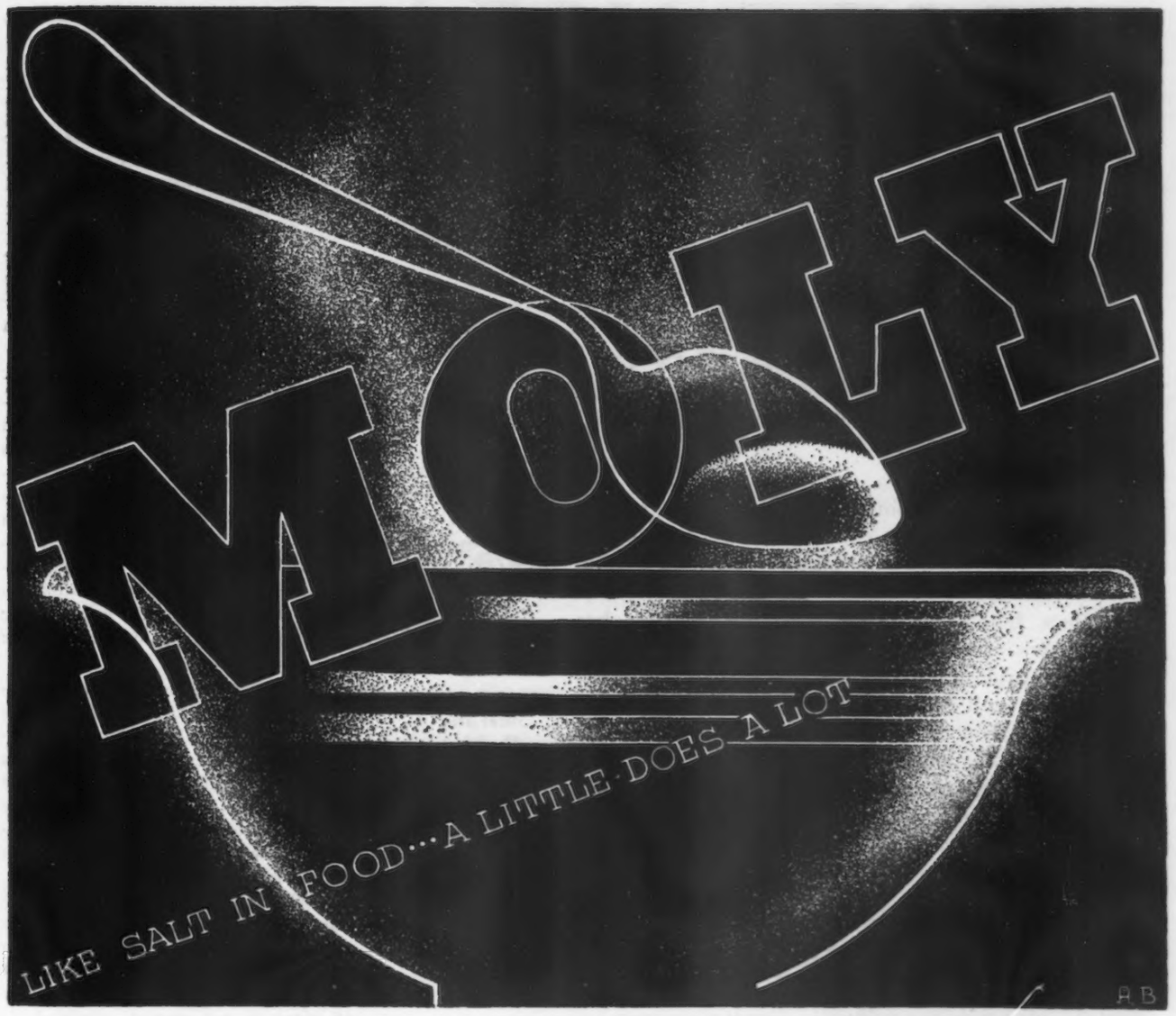
"The need for replacement of old equipment by modern machines is obvious to hundreds of potential buyers. From the standpoint of shop economy, they want to buy, and know they should buy today.

"But in the face of present monetary uncertainty, and possibility of further governmental restrictive measures, they are afraid to commit themselves to any purchases save those which are absolutely necessary to keep the wheels turning from day to day.

"It is the extreme uncertainty of the situation, especially with respect to monetary stability, which is at present the most powerful deterrent to increased business. What people want to know is, 'Is there or is there not to be further inflation and devaluation of the dollar? If the dollar is to be further devalued, at what point is it to be stabilized?'

"Once a firm answer has been made to these questions, business men may make future commitments with some degree of assurance, at least, as to the outcome. In our business the result would be, in my opinion, an immediate and substantial increase in machine tool orders, paralleling a sharp upturn in volume of general business and employment.

"If the answers to these questions are not forthcoming, the outlook for the fall and winter holds promise of little more save a continuance of the present attitude of caution and postponement."



AN INTERESTING example of what a lot of work a small amount of Molybdenum can do may be found in the following comparison of two steels:

	No. 1	No. 2
C	.28/.37%	.23/.30%
Mn	.30/.70	.30/.70
Cr	.65/1.35	.75/1.00
Ni	3.00/3.50	2.55/3.05
Mo	nil	.30/.50
Elastic Limit	116,700 p. s. i.	130,000 p. s. i.
Ult. Tens. Strength	135,200 p. s. i.	142,000 p. s. i.
Elong. % in 2"	19.6	20.5
Red. of Area %	57.1	65.0

Thus it will be seen that the addition of *less than one-half of one per cent* Molybdenum, with lower Nickel and Chrome, produced an increase of 13,000 lbs. in Elastic Limit and 7000 lbs. in Ultimate Strength. At the same time, Elongation was raised 1% and Reduction of Area 8%.

This is just one of various directions in which "*Moly Improves Steel and Iron*" (which is the title of a book we have recently printed for the benefit of executives and engineers). The cost of the small amount of "Moly" required is in distinctly profitable relation to the results achieved.

Our new house-organ, "*The Moly Matrix*," enables you to keep up to date in the progress of Molybdenum. Ask to be put on our mailing-list. Write also for these interesting new books: "*Molybdenum in* 1934" and "*Molybdenum in Cast Iron* — 1934 *Supplement.*" If you have an alloy problem, let our metallurgists and modern experimental laboratory in Detroit help you. Climax Molybdenum Company, 295 Madison Avenue, New York.

VISIT OUR BOOTH, NO. 114, AT THE NATIONAL METAL EXPOSITION, NEW YORK, OCTOBER 1-5
VISIT OUR BOOTH, NO. 108, AT THE INTERNATIONAL FOUNDRY CONGRESS, PHILA., OCTOBER 22-26

CLIMAX Mo-lyb-den-um

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Production Problems in Enameling Iron and Steel

(Continued from Page 27)

making possible the fusing of the batch within commercially practicable ranges; and (3) Covering materials, giving the enamel its necessary opacity and color.

Illustrating this in an effective way, Dr. Ludwig Stuckert, German enameler, has developed a diagram, shown herewith, plotting the various raw materials which contribute three primary essentials to the enamel batch for ground and cover coats. These are designated as (a) elasticity, compressive strength and chemical resistance; (b) fusibility and expansiveness; and (c) opacity. It was found that the combinations of these different classes of materials giving practical results were confined within two small areas. On the diagram, these are indicated as ABC, representing good ground coat enamels, and CDE, designating good cover coat enamels, respectively.

Other technical enamelists have classified the primary materials somewhat differently, but the fundamental point remains the same. Similarly, it must be held in mind that every enamel raw material contributes more than one distinct characteristic. The diagram noted emphasizes the primary property of the ingredient. Thus, an "opacifier" might impart, as well, certain fusibility, not necessarily desired.

The importance of thorough understanding of various raw materials and their behavior in enamel glass, is readily apparent from a brief consideration of any one of the many requirements of the finished ware in actual service. For instance, resistance to rapid heating and cooling, sudden impact, acid resistance, and so on. Each of these presents a particular problem in the manufacture of the product.

A primary consideration in the production of good enameled ware is the reducing of mechanical strains between base metal and enamel to a minimum, in other words, making the enamel "fit" the iron or steel, as the case may be. This is of utmost importance in certain types of ware, such as cooking utensils, for example, subjected to constant repeated heating and sudden cooling. The base metal, itself, is reasonably able to withstand this severe service, but the enamel, with the brittle characteristics of glass, is not so well qualified.

But it is not only in actual ultimate use that enameled products are exposed to disruptive strains and extreme service, for during the manufacturing process they are required to withstand considerable compressive and tensile stress. When it is considered that the entire process of heating, fusing the enamel, and cooling takes but a few minutes, the severity of the treatment can be readily appreciated.

For example, take a slab of hot, enameled iron as it leaves the furnace and passes through the cooling process. The metal contracts at a fairly uniform rate. At first the enamel is in liquid form and exerts no retarding force on the contracting metal base; as soon as it begins to solidify, however, the conditions change. The particles of crystallizing enamel grasp the irregular projections of the metal surface, harden and adhere. If both metal and enamel had precisely equal coefficients of expansion, they would

LIQUIDATION SALE

of GRIGSBY-GRUNOW CO., INC.

makers of *Majestic* RADIOS, TUBES REFRIGERATORS

by order of the UNITED STATES DISTRICT COURT

PURSUANT to an order of the United States District Court, the Trustee in Bankruptcy of the Grigsby-Grunow Company, Inc., offers for sale all of the machinery, equipment, inventory, good will, patents, trade marks and trade names of the Grigsby-Grunow Company, Inc., as well as real estate and buildings used in the manufacture of MAJESTIC radios, tubes and refrigerators.

The machinery consists of the very finest makes of all types of metal working and wood working machinery, also a completely equipped tube plant, enameling plant and plating plant, all of which are in immediate operating condition.

The inventory consists of made-up parts, parts in process and raw materials for radios, refrigerators and radio tubes. The Service Department on all three items has been kept intact.

The good will consists of the name "MAJESTIC" as applied to radios, refrigerators and tubes, which name has been extensively advertised throughout the world, and which name is secured by copyrights in practically every country in the world. The good will also includes many other names, trade names, patents and copyrights.

The real estate consists of factory buildings which have a floor area of approximately 950,000 square feet, and are suitable for almost any type of manufacturing.

The Trustee is authorized to sell at public or private sale, and is now prepared to receive offers for any part or parcels of the assets, which offer if satisfactory will be approved.

Full opportunity will be given to prospective buyers to inspect the assets. Competent salesmen will be in attendance at the plant, 5801 Dickens Avenue, Chicago, Illinois, at all times, and an early investigation of the property is solicited.

A complete catalog, listing the assets to be sold, has been prepared and will be available to any prospective buyer on request to Mr. Frank M. McKey, Trustee in Bankruptcy, Grigsby-Grunow Company, Inc., 5801 Dickens Avenue, Chicago, Illinois.

REFRIGERATION SERVICE DEPARTMENT

The Trustee, under order of the Court, has set up a Refrigeration Service Department, to maintain service and to sell service parts for refrigerators. This will maintain the name and prestige of "Majestic" before the public and be an asset of major importance to anyone buying the "good will" of the company.

SERVICE PARTS FOR RADIOS

There is on hand a considerable quantity of service parts for radios which are staple merchandise and are being sold to the users of the millions of Majestic radios now in service.

LUMP ORE FOR OPEN HEARTHS
IRON ORE • PIG IRON • COAL
COKE ALLOYS
THE CLEVELAND-CLIFFS IRON CO., CLEVELAND O.

contract at the same rate and no excessive strains would occur. Actually, however, the enamel always contracts at a much slower rate than the base metal and consequently it goes under compression, the compressive force increasing as the cooling proceeds.

If the compressive force subjected in this way is greater than the resistance of one or the other of the layers, the weaker one, naturally, will give way. The enamel, being brittle, is generally where the failure results, and the material chips off. In the case of thin sheet metal, however, the reverse frequently is the case, the metal showing failure through warping or buckling. Such defect, of course, is more liable with flat sheets than with such products as cooking ware, which have a certain natural reinforcement due to shape.

Again, the compressive force applied through manufacturing process is not always sufficient to develop failure, as intimated, and many enameled pieces of metal cool down without visible damage, though actually in a state of strain. The material, however, may be just on the borderline and may fail subsequently on comparatively slight handling, such as a light blow or sudden cooling while hot. That such invisible strain exists is shown by the fact that enameled sheets by actual measurement are larger after being enameled and cooled than would be the case were the same metal permitted to cool without the glass coating. Mayer and Havas, German enamelists, have found that metal with a ground coat of enamel has a coefficient of expansion 10 per cent less than a plain metal sheet, indicating the retarding effect of the enamel application on the expansion and contraction of the metal base.

The annealing action sustained by the iron base in cooling exerts a certain effect in reducing the tension, taking some of the structural strength of the metal. This is true particularly in cast iron enameling, where the base metal is of sufficient thickness to cool relatively slow, as compared with sheet materials. Moreover, strains are reduced somewhat by reason of the enamels having a lower heat conductivity than the metal; as the enamel coat is always at a reduced temperature in comparison with the base material, its expansion and contraction work out over a narrower range.

More important than these strain-alleviating factors and reactions, however, is the development of the proper enamel for the base metal—an enamel that will show highest consistent elasticity, with coefficient of expansion as close as possible to the base material, and which will fuse readily. This reverts to the actual enamel composition, the adjustment of the batch to the needs of the particular base metal, whether iron or steel, and definite consideration of the requirements of the porcelain enameled product in use.

As has been noted previously, accurate knowledge of the functions and limitations of enamel raw materials is necessary for this accomplishment.

Of equal importance is the proper selection of the steel or iron base metal. The right metal will assist considerably in making for right results in finished enameled ware. Material that is especially developed for porcelain enameling purposes, made accurately to gage and having the definite qualities to assist fusion of the glass enamel, will prove by far the more desirable for real efficiency in processing and minimum trouble. Such base metal may infer a slight increase in initial cost, but will pay for itself many times over in actual production. As many enameling plants have come to learn, the proper base metal is a highly essential attribute to good enameling and satisfactory porcelain products.